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AMERICAN JOURNAL OF PHARMACY

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THE AMERICAN
JOURNAL OF PHARMACY

DECEMBER, 1917

EDITORIAL.

HONORA TUAM PROFESSIONEM.

A friend recently remarked that, "in his opinion, the most important thing for a person's happiness was employment in a congenial occupation." This, likewise, becomes an important factor in determining success.

The selection of a vocation for one's life work is a serious problem confronting each youth and in the decision of this all important question, the young man or young woman should have the advice and guidance of the more mature. Only too often is this, as a parental duty, neglected and the decision is prone to be made by an accidental opening for employment or by haphazard selection without due consideration being given to the physical and mental qualifications and that innate aptness possessed by each normal individual.

Errors in the selection of vocations, misfits in their callings, are everywhere in evidence. To the individual the result from such error is indeed serious and must cause discontent and lack of expected success if not actual failure and these constitute a hindrance to the progress of society. The nation's loss from such misfits, if estimated on a monetary basis, would be an appalling sum. Yet, what has been done by the community, or by state or federal authority to overcome this defect, with its detrimental influence on the national progress? Are our educators alive to the importance of this question? Are those who are directly associated with professional and technical educational institutions giving this subject the needed consideration?

At times, the writer has been pained to note the growing tendency to speak disparagingly of one's own calling. Possibly this can

at least be partly attributed to the misfits publicly venting their discontent and relieving their burden of unhappiness. The major part, however, is attributable to thoughtlessness, to that apish tendency to follow example, to take part in the fad of the moment. This heedlessness, only too often in evidence in public, takes no cognizance of the influence of words.

> "Boys flying kites haul in their white-winged birds;
> You can't do that way when you're flying words.
> Things that we think may sometimes fall back dead;
> But God himself can't kill them when they're said."

At a recent pharmaceutical convention the whole atmosphere for a while seemed to be surcharged with expressions far from complimentary to pharmacy, and conversely not very creditable to the efforts of the educators, some of whom so volubly declaimed against pharmacy, nor to the value of the work of the educational institutions they represented.

How many promising young men have been deterred from entering pharmacy or driven from its ranks by the heedless remarks of those who should, in honor to their profession and likewise their own interests, have lent every effort to the upbuilding of the profession and the enrollment of the best of our youth in its service! As a typical illustration, the day that the writer was initiated into the arts and mysteries of the apothecary shop, he was introduced to a gentleman then quite prominent in the Philadelphia drug trade. How encouraging was the greeting received in the following: "So you are the new boy who expects to become a pharmacist; take my advice; don't do it young man, better go down to the foot of the street and drown yourself in the Delaware River." Needless to say the advice has not yet been accepted.

Let us frankly admit that pharmacy has its shortcomings and defects. However, is there a single profession of which the same cannot today be truthfully said? The legal profession has its pettifoggers and shysters, medicine its quacks and cult charlatans and the hypocrite has to be deposed from the Church of God. The duty of those who are worthy of the name of leaders in pharmacy is plain; [illegible] constructively criticize and help in the evolution of pharmacy to a higher plane of professionalism. While holding aloft the ideals of professionalism, refrain from demoralizing the foundation that has already been constructed for our professional edifice. Lend

a helping hand to the druggist who is battling in the slough of commercialism; who, probably from necessity and not choice, is between the upper millstone of the prevailing unethical practice of medicine and the lower one of supplying the drug needs and demands of his environment.

G. M. B.

THE DEPARTMENTS OF THE GOVERNMENT NEED THE ADVICE OF THE DRUG TRADE.

Many of the rules and regulations promulgated by the Federal Departments show prima facie a lack of actual knowledge of the industries affected. This is especially true as to the requirements of the drug trade and the prevailing conditions and trade customs under which the supplying of the needs of the inhabitants of the country for medicines and the industries for drug and chemical products has to be carried on.

There is evidenced in many ways that those in authority in the various departments of our government have failed to grasp the importance of the drug and chemical industries and the national necessity for conserving these and encouraging their fullest development. As a necessity of life, medicines must be classified with such other prime necessities as food, fuel and clothing. The conservation of all materials considered as necessities of life or as needed for war and the providing of ample supplies of these for the needs of our country and our allies, has been recognized as a great national problem calling for the advice and aid of the highest scientific experts and of specialists in the various trades and industries. Nevertheless, in the organization of the National Council of Defense, the drug trade, controlling one of the prime necessities of life and of no secondary importance in providing alike for the needs of the army, the navy and of the civilian population, was entirely ignored. Medicine and surgery, *whose functions are the application of drugs in appropriate ways and doses, properly has nothing whatever to do with the real problems at issue here, yet medicine boldly attempts to usurp the functions of pharmacy.*

In the National Drug Trade Conference there is always available for consultation by Congress and the departments a competent committee of gentlemen representing the pharmaceutical and the various drug trade organizations who are thoroughly conversant

with the needs alike of their calling and of the nation. In addition, the several national organizations representing pharmacy have standing committees always ready to give advice or render material assistance if needed.

All of this expert knowledge is available to the government and has been cheerfully proffered. Nevertheless, time after time, the advice, recommendations and suggestions offered by these competent representatives of the drug interests have been ignored and the ipse dixit of some department "desk expert," lacking in the essential practical knowledge or experience, has been accepted instead. It is not to be wondered at that the regulations promulgated under the existing conditions are full of inconsistencies and impracticabilities.

We are not prepared to admit that Congress without departmental mal-advice would have singled out the drug business, already thoroughly disorganized by the abnormal war and trade conditions, for special taxation. We cannot conceive that the law-enacting body would have deliberately violated basic humanitarian principles, by adding enormous price burdens on the medical needs of the suffering. If Congress had accepted proper advice this basic error would have been avoided and other materials less important to life than medicines should have carried this portion of the taxation.

The alcohol tax has been a most vexing question affecting the drug trade and the regulations framed by the Internal Revenue Department are not only confusing but in some respects impracticable and well illustrate the need for trade counsellors. In the War Revenue Act, Congress deliberately provided for non-beverage distilled spirits at a less rate of tax imposed than upon spirits when "used or intended for use as a beverage." It is well known that this action was not in accord with the desire of the Treasury Department, whose experts represented to the congressional committees that "the Department was unable to distinguish between alcohol to be used as a beverage and that for other purposes." The provisions of Section 300 of this Act are in harmony with and further the purposes of the Food Control Act previously enacted. The intent of Congress undoubtedly was to give all legitimate users and manufacturers, of other than beverages or beverage products, requiring pure ethyl alcohol, and who from the nature of their uses or products could not use "denatured alcohol," the right to use "non-beverage alcohol" at the lesser rate of taxation.

Among the uses for non-beverage alcohol that Congress had in mind was the medical uses and such legitimate manufactures as food products, pharmaceuticals and perfumes. The latter was specifically named in a clause providing that the same rate of tax be levied on the alcohol in imported perfumes as was paid on non-beverage alcohol used by the domestic manufacturer.

The regulations as promulgated under the Food Control Act with the approval of the President are simple and provide for the proper labelling of spirits produced for non-beverage purposes after the passage of the Act and the penalizing of violators.

The regulations covering non-beverage alcohol promulgated since by the Treasury Department attempt to cover both of these laws and are complicated and confusing, and, despite the several modifications made in subsequent rulings, these are still far from clear.

Among its other provisions the original Treasury regulation on this subject forbade "the selling or delivery" of non-beverage alcohol "to any person, firm or corporation not qualified as a user or dealer" (*i. e.*, by taking out a permit and filing a bond) "and then only upon delivery by the person so qualified of an application therefor in due form, approved by the collector of the district in which the applicant's place of business is located."

Under the regulations a druggist must qualify by first filing an application in duplicate for a permit and giving bond in duplicate and then can purchase the alcohol only on approval of the collector of the district. The druggist having complied with this regulation cannot sell to the baker or confectioner any of this non-beverage alcohol for cutting the flavors used in their business until they each have gone through the same rigmarole. Moreover, a customer who needs some alcohol for external application to reduce the temperature in a fever-stricken member of his family, must be denied even when a prescription is furnished, unless he likewise has gone through the prescribed rigmarole that will make him also an official user or purchaser.

To meet the strenuous objections of physicians and patients to this radical ruling the ***regulations*** were modified. The modified Treasury decision 2559 now permits "'pharmacists,' who hold permit and have given bond, to sell non-beverage alcohol either with or without a physician's prescription, to persons who do not hold permits and who have not given bonds under the provisions of Treasury decision 2559, in quantities not exceeding one pint, but not in advance of

orders, provided they first medicate the same in accordance with any one of the formulæ recited."

The denaturants permitted are carbolic acid, formaldehyde, mercuric chloride, lysol and liquor cresolis compound used in the proportion and formulas given. In the formulation of this modification the Department has taken the formulas given in a prior standing regulation for the denaturing of tax-free alcohol for scientific purposes in medical schools and hospitals, in which it is aimed to make the alcohol absolutely unfit for other purposes and in which regulation "the sale is prohibited" of such denatured alcohol. Alcohol so denatured by any of the ten permissible formulæ is totally unfit for the purposes for which non-beverage alcohol is commonly needed, with the possible exception of the uses of the undertaker.

We are compelled to consider such regulations as inconsistent, impracticable and absolutely foreign to the intent of Congress. Their purpose would to be appear to make the procuring and use of non-beverage alcohol so troublesome, that many will be deterred from its legitimate use and compelled to purchase and use beverage alcohol at the higher tax rate.

Regulations should be bona fide efforts to carry out the purpose and intent of the law and not mal fide attempts to demonstrate advance statements of a Department's inability or to nullify the will of Congress.

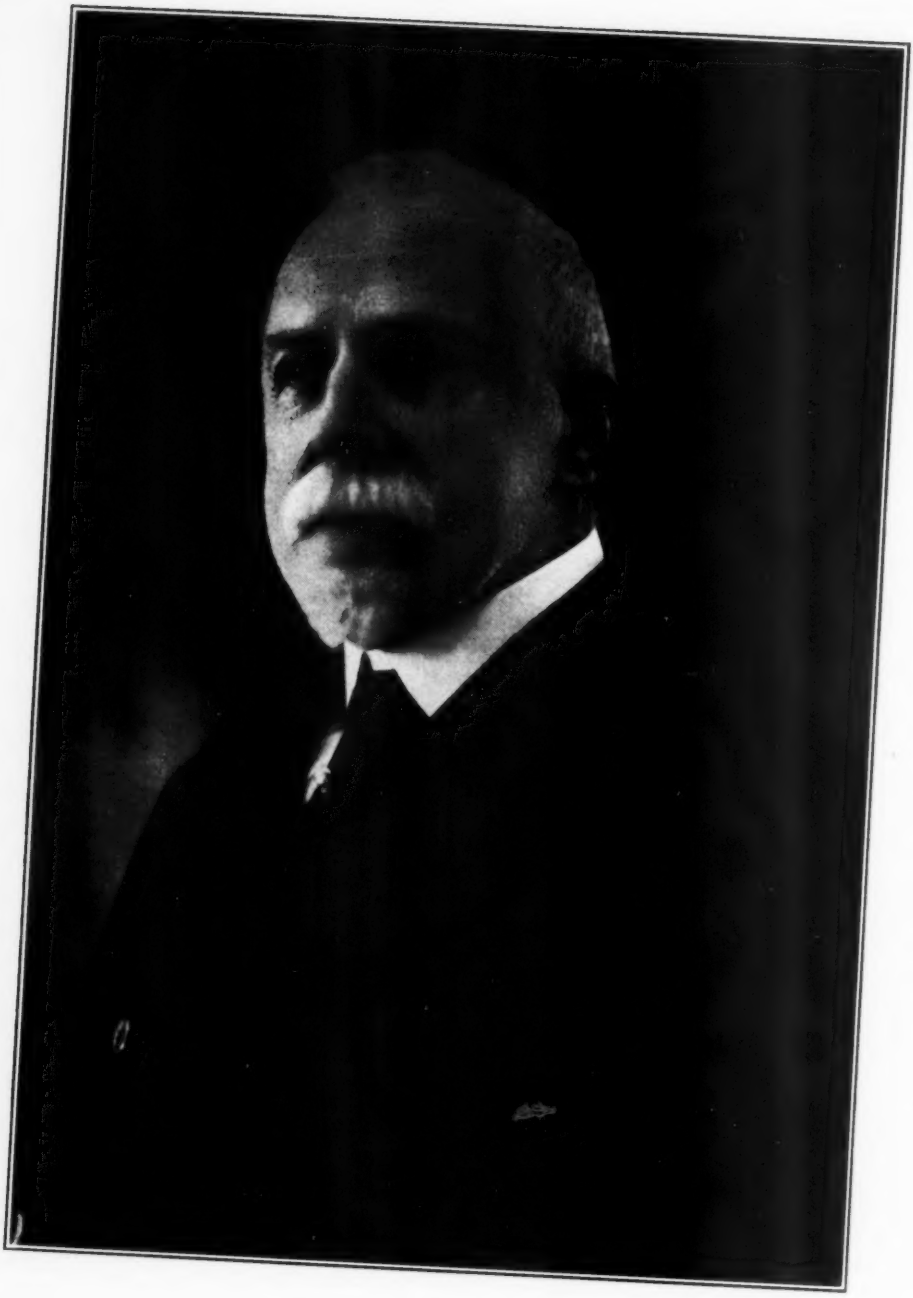
A prime necessity of the time is that the trade interests and the industries should be maintained at their highest efficiency and built up to withstand the strain of unusual conditions and the burden of increased taxation. The immediate collection of a revenue tax is not the sole duty of a department of the government.

G. M. B.

AN OLD TRUTH REDISCOVERED.

In a recent issue our esteemed contemporary, *The Druggists Circular,* announced that "the New York City Health Department had abandoned the Ehrlich Diazo test of urine for typhoid fever," and declared this test "to be useless and of little or no diagnostic value."

In an article published in the AMERICAN JOURNAL OF PHARMACY, November, 1892, page 559, the unreliability of this test was pointed out and it was therein stated that "typical reactions were



Thos. Caspar Jr.

obtained not only with known typhoid urine, but also in remittent fever and frequently where there were no febrile conditions at all." The article referred to, twenty-five years ago, conclusively proved that very small quantities of peptone, creasote and a number of phenolic or other substances which might occur in urine, either as normal constituents from food ingestion or from medication, produced the reaction claimed by Ehrlich as indicative of typhoid fever.

At that time, the contributor wrote, "I am compelled to question the claims that have been put forth for this test." "While the absence of the reaction may indicate the absence of typhoid, the presence of the reaction would not warrant the diagnosis of typhoid unless supported by other evidence, as many of the products producing the reaction, notably phenol and peptone, may be present in the urine from other causes."

G. M. B.

CHARLES CASPARI, JR.

By Evander F. Kelly, Phar.D.,
Baltimore, Md.

In the death of Charles Caspari, Jr., which occurred at his home in Baltimore on October 13, pharmacy lost one of its most notable exponents, a loss which will not be fully realized until others have attempted to carry on the many-sided activities of this truly remarkable man.

He was the son of Charles Caspari, a pharmacist of ability and reputation who emigrated from Hanover, Germany, to Baltimore in 1848 and conducted at 44 North Gay Street the first German pharmacy in this city until his death in 1870. The mother, whose maiden name was Louise Kleyensteuder, was from Bremen, and to the high ideals, faithful home training and sound preliminary education, which his parents provided, did the son ascribe much of his later success.

Charles Caspari, Jr., was born on May 31, 1850, at 44 North Gay Street and made his home there until after his father's death. His primary education was obtained at the private school conducted by Mr. Scheib, pastor of the Zion German Lutheran Church, in which church he was christened and which was next door to his home. Then he entered the department of arts and sciences of the

University of Maryland, afterwards discontinued but then under the direction of Dr. Dalrymple, an educator noted for his thoroughness, broad scholarship and fidelity to the older ideals in education. The student spent four years in this atmosphere, so like that of his home, and became possessed of that thorough and diversified liberal education which was to be reflected in his own work as author, teacher and editor. Lessons were studied in the forenoon in English, to be repeated on alternate afternoons in German and French. At the age of fifteen this training was completed and he began his pharmaceutical education, the foundation for which his father had so well laid, as an apprentice in the store of Sharp & Dohme. Here he came under the influence of Mr. Louis Dohme, to whose knowledge and ability as a preceptor was attributed much of his detailed and thorough information about pharmacy and chemistry. The preceptor outlined a comprehensive course in theory and practice and gave liberally of his time and advice to see that his apt pupil accomplished every task promptly. He entered the Maryland College of Pharmacy in 1867, graduating in 1869, at the same time completing his apprenticeship, and continued in the employ of Sharp & Dohme.

Upon the death of his father, the son entered the practice of pharmacy as his successor and continued the business until 1875, when he sold it and bought a store at Baltimore Street and Fremont Avenue. Later an interest was also acquired in a store at Harlem Avenue and Carey Street, and he conducted these places of business until 1890, when it became necessary for him to devote his entire time to other interests. In the conduct of his stores, he maintained the high ideals which he professed and gained the full confidence of his customers and of the physicians. During 1876 and 1877, he traveled extensively for Sharp & Dohme.

Dr. Caspari had, in the meantime, entered his true vocation, when in 1879, he succeeded the late J. Faris Moore as professor of the theory and practice of pharmacy in his alma mater, a work he was to continue until the day before his death and to which he gave his full measure of devotion. While his success as a lecturer was immediate, he considered as possibly his greatest contribution to the teaching of pharmacy, the inauguration of a laboratory for instruction in practical pharmacy, the first in this institution. He became dean of the faculty in 1896, and continued as such after the college became the department of pharmacy of the University of

Maryland in 1904, also representing it on the board of regents of the university and on the university council. The university conferred the honorary degree of doctor of pharmacy upon him in 1907 in recognition of his many attainments. During the last three years, he has been lecturer on pharmacy in the Johns Hopkins Medical School.

Dr. Caspari has contributed regularly to the current literature of the profession since his graduation, and yet his ability as an author was not fully recognized until the appearance in 1895 of his "Treatise on Pharmacy," which was only last year revised for the 5th edition, and which is a standard, "preëminently intended to be one of insturction and aid in the study and use of the Pharmacopœia." For years, he has also been the pharmaceutical editor of the National Standard Dispensatory.

As a member of its Committee on Revision, and as a Vice-President of the Pharmacopœial Convention, 1910, Dr. Caspari has done valuable work on the revisions of the Pharmacopœia undertaken in 1890, 1900 and 1910, and was a member of the executive committee of the last as chairman of the subcommittee on nomenclature. He was also a member of the National Formulary Committee for the first and second editions of this work, acting as chairman of the subcommittee on additions in the latter revision.

The success of pharmaceutical and allied associations was of great interest to Dr. Caspari, possibly that of the Maryland Pharmaceutical Association, of which he was one of the organizers in 1882 and a charter member, and the American Pharmaceutical Association, which he joined in 1884, more than others, although he was an active member of the American Medical Association, American Chemical Society and other scientific and professional bodies, and an honorary member of many others. He filled many important offices in his state and national association, but resolutely declined election to their highest office. In the national body, he was elected permanent secretary to succeed Professor Maish in 1894, and in 1896 was made general secretary, which office he resigned in 1911. To the duties of this office and the interests of the association was given possibly his greatest efforts and devotion next to his work as a teacher, and with results which this short memoir could not possibly set forth, but which are not only nationally but internationally appreciated. As an editor of the mass of pharmaceutical literature

which passed through his hands in connection with this office, he set a standard which is a marked tribute to his diversity.

When Maryland adopted a Pure Food and Drugs Law in 1910, Dr. Caspari was turned to as the man to act as the first food and drugs commissioner, to inaugurate the operations of the law and to organize the necessary machinery to carry out its provisions. His work here, so unlike in its scope any other he had undertaken, was an honor to his beloved profession, and he not only protected the public from fraud, but markedly raised the standard of the food and drug products of the state, at the same time gaining the admiration of those concerned for his fairness and impartiality.

Dr. Caspari was interested in all matters of public and individual welfare and most of these interests were known only to his close friends.

His family life was particularly happy. Mrs. Caspari was Miss Leslie V. Heinichen, of Fredericksburg, Va., and it is a great regret to all who have known of their happy life together that Dr. Caspari was not spared to celebrate their golden anniversary. They were married in 1874, and to them were born seven children, five daughters and two sons, six of whom are living.

"Work was the motif of his life," not to gain but to accomplish, and this unflagging industry, with his exceptional training, ripe scholarship, broad experience and natural ability, assured success beyond the usual in all he undertook, and made great impress on all with whom he came into contact, particularly his many students. A virile man, of charm of manner, of true modesty, of innate refinement, of simplicity of life, of obvious honesty in intent and act, who did, to the best of his power, his duty as he saw it, without favor and without claiming infallibility; who was frank, without rancor, and expected equal frankness; he would be the first to acknowledge any such frailties as made him human.

THE POSSIBILITY OF A UNIFICATION OF PHARMACOPŒIAL STANDARDS.[1]

By George M. Beringer, A.M., Ph.M.

Your honored president, Dr. T. H. Carmichael, my esteemed friend ever since the days of our youth when we were classmates in the Central High School of Philadelphia, invited me to address you on this occasion. His invitation was construed as a friendly command. He generously assigned to me no stated subject and I trust that the topic that I have selected may prove acceptable and, possibly, that the suggestion contained may merit further consideration.

The necessity for uniformity, for standardization, in order to attain the highest efficiency and to obtain the most satisfactory and concordant results is now more fully appreciated than ever before in the history of the world. Today, the demand for standardization is evidenced in every line of human activity; whether we consider the mechanical industries, manufactures, agriculture, arts, education, the professors or any of the sciences, in whatever way the attention is directed, one discerns the same strong current. As human judgment is far from perfect, it must be allowed that some of these efforts at times rather deflect than aid true progress and that, temporarily, normal views have been obscured and real advancements retarded.

When one studies any of the sciences, whose function it is to set in orderly array the truth in the selected line of research and study, he becomes aware how this so-called "modern wave" is after all but a continuation of that desire for higher mental, spiritual or material attainment which was created with the implanting in the human mind of that attitude which we call ambition. Moreover, he is impressed with the truth that idealistic ambitions are never fully realized; that there are some things concealed from man, some things still higher and beyond human reach. Likewise he learns that the ambitious striver for the higher goal is subjected to the suspicion, envy and dislike of fellow men. The poet Byron aptly wrote:

[1] An address delivered before the Homeopathic Medical Society of the County of Philadelphia at the meeting in Hahnemann College, October 11, 1917.

"He who ascends the mountain tops shall find
The loftiest peaks most wrapt in clouds and snow;
He who surpasses or subdues mankind,
Must look down on the hate of those below."

The physician or pharmacist who delves into the history of his profession, and especially that of materia medica, discovers how many of the practices of this day and generation are but the reflections of very ancient usages. The prescription and the formula are only some of the means that were adopted to systematize the practice of medicine by the application of standards, definite instructions and rules of procedure. Early Egyptian inscriptions show that the priests of Isis were the pharmacists to whom the physician priests sent their prescriptions to be compounded. Papyrus records containing directions for such prescriptions have been traced back to dates ranging from 1550 to 3300 B.C.

Biblical history, likewise, furnishes some interesting information as to the ancient practices and the uses of drugs among the Israelites, In Exodus we find a detailed account of the ceremonies adopted for the dedication of the temple and the consecration of the priests. In Chapter XXX is given this exact formula for the preparation of the holy anointing oil:

"Take thou also unto thee principal spices, of pure myrrh five hundred shekels, and of sweet cinnamon half so much, even two hundred and fifty shekels, and of sweet calamus two hundred and fifty shekels, and of cassia five hundred shekels, after the shekel of the sanctuary, and of olive oil an hin;

And thou shalt make it an oil of holy ointment, an ointment compounded after the art of the apothecary: it shall be an holy anointing oil."

Again in verses 34 and 35 of the same chapter note the formula for the holy perfume or incense:

"Take thou unto thee sweet spices, stacte, and onycha, and galbanum; these sweet spices with pure frankincense: of each shall there be a like weight:

And thou shalt make it a perfume, a confection after the art of the apothecary, tempered together, pure and holy."

Although these formulas date back to about 1500 B.C., it is noteworthy how typical they are of the modern prescription, not only in the form and language used but also as to the drugs and spices named. An analysis of the wording brings out more forcefully this similarity. These mosaic formulas both start with the word

take, "take thou" and "take unto thee" and the custom still continues in medical practice, as each prescription written has as the initial direction the symbol ℞, an abbreviation of the Latin "Recipe," or "take thou."

The instruction to use only *pure* myrth and *pure* frankincense and only *sweet* cinnamon and *sweet* calamus can be construed only as an admonition in order to maintain quality and indicates that even in those early days substandards goods were on the market. The specification of the weights and measures to be taken shows, likewise, that the Israelites, following the custom of other nations, had adopted a national standard system of weights and measures and that the lawgiver was impressing the fact that adherence to these standards was essential in order to obtain a uniform product.

Moreover, note the statement "after the art of the apothecary." This proves that, even at that early date, pharmacy was recognized as a distinct calling and the apothecary as a man of skill and learning filling a responsible position in society and that his special knowledge and art was necessary for the proper compounding of medicines. Further, that ointments and confections were well-known forms in which his products were exhibited and likewise that then as now not infrequently he was a perfumer as well as an apothecary.

The XIII Chapter of Leviticus gives directions for the diagnosis of leprosy and the method of differentiating between that disease and other affections of the skin and instructions for the isolation of the unfortunate leper.

These examples serve to show how long the principles of systematic study and of standardizing the practice of medicine by the use of accepted methods and formulas have governed professional medicine. In fact, this is the very basis for our distinction between ethical medical practices and empiricism and quackery.

The necessity for uniformity in medical and pharmaceutical practices has caused each of the civilized nations to prepare a pharmacopœia the standards and formulas of which are the official guides for the important medicines dispensed within the political boundaries of each nation. The need for such accepted standards becomes a recognized necessity in the early history and independent autonomy of each nation.

The Pharmacopœia of the Military Hospital of the United States Army published in Philadelphia in 1778, and intended to supply the needs of the Military Hospital of the Colonial Army then located

at Lititz, Lancaster Co., Pa., is believed to be the first American attempt at such a standardization. The first edition of the United States Pharmacopœia was published in December, 1820. This was the result of discussions of the subject extending over a period of some fifteen years or more which was finally directed into definite action by a paper submitted in January, 1817, by Dr. Lyman Spalding to the Medical Society of the County of New York in which he outlined a project for the formation of a national pharmacopœia. His plan called for a convention of delegates from the medical societies and schools of the United States to be held in the city of Washington. The convention was convened in 1820 and their deliberations were consummated in the first edition of the Pharmacopœia of the United States.

Fortunately, before adjourning this general convention of 1820 arranged for the future revisions of the book by providing that the subsequent pharmacopœial convention should be called together in the same city in 1830. This plan for the regularly convening of delegates in a national pharmacopœial convention in the decimal year has been continued and by this method we have so far had prepared nine decennial revisions of the U. S. P.

The Pharmacopœia of the United States is prepared on a truly democratic plan, differing entirely from the methods in vogue in other countries in which usually a commission is appointed by the government to discharge this national duty. The United States Pharmacopœia is the peer of any of these national authorities and abroad it has been spoken of as "the autocrat of the pharmacopœias." That the American plan of revision is fundamentally sound has been demonstrated by its withstanding the criticisms of nearly a century and likewise by the success that has attended the plan and the acknowledged standing of the resulting work.

The desire for international as well as national harmony of pharmacopœial standards has been a topic receiving the merited consideration of prominent authorities in many countries. The Conference held in Brussels in 1902 and entitled Conférence Internationale pour l'Unification de la Formule des Médicaments Héroïques was an important movement with that end in view. The conclusions of this convention as set forth in an international protocol have been very largely adopted in the revisions of the various national pharmacopœias that have appeared since that date. A few of the recommendations made therein have not been universally ac-

cepted and moreover progress in the medical sciences since that time has presented some new problems, so that there is now great need for another international conference on the subject.

The Federal Food and Drugs Act of 1906 named the United States Pharmacopœia and the National Formulary as the legal authorities for drugs and their standards of strength, quality and purity thus became the law for such drugs and formulas as are included in these works. While we had, as the result of the unselfish labors of the revisers of the Pharmacopœia and National Formulary, two standard books that could be recognized as legal authorities for most of the drugs commonly used, it is noteworthy that there were no such standard authorities for the foods consumed and this deficiency has not yet been supplied.

I am well aware that the Federal Food and Drugs Act also failed to provide standards or to designate any published work as the accepted legal authority for purely homeopathic medicines. In my opinion this was an oversight that should have been corrected as a number of homeopathic drugs and preparations are of such extensive use that standards of quality and purity should have been named.

The failure of the efforts of the homeopathic practitioners to secure favorable action by Congress to an amendment of this Act providing for standards for homeopathic medicines is now a matter of history. It is unfortunate for homeopathy that the followers of that school of medicine in the United States are not unanimous in their support of only one authority. Some accept the Homeopathic Pharmacopœia of the United States as their guide, others insist on using the American Homeopathic Pharmacopœia. This difference may have unfavorably influenced Congressional consideration of the proposed amendment to the Act of June 30, 1906, to recognize homeopathic standards.

In the states that by enactments have established legal standards for homeopathic drugs there is a lack of harmony. The Act of the Pennsylvania legislature approved June 7, 1917, in both sections 2 and 3, provides that the American Homeopathic Pharmacopœia shall be the standard of strength, quality or purity for homeopathic drugs sold in that commonwealth and the Food and Drugs Act of the neighboring state of New Jersey names the Homeopathic Pharmacopœia of the United States as the legal authority in that state. These are but examples of the existing conflict of opinions, the

elimination of which would probably aid in securing federal recognition of homeopathic standards.

As the time fixed for the holding of the Pharmacopœial Convention in 1920 is rapidly approaching, it is both opportune and appropriate that changes proposed to be made in the tenth revision should be discussed. The proposition that I present to you now, it must be understood, is upon my own initiative. It has not yet been discussed with any one and must not be construed as being in any way an official proposition emanating from or authorized by the Committee of Revision of the Pharmacopœia.

My thought is that there should be but one American Pharmacopœia and that should be the Pharmacopœia of the United States of America. As the legal authority of this nation, the scope of this work should be so extended and broadened as to supply proper standards for all medicines of known composition or formula that are commonly used by any recognized school or branch of medicine. In just so far as the Pharmacopœia fails in doing this, it fails in discharging its function as a legal authority. In order to fulfill its national obligations its pronouncements cannot be limited to the ideas of any school or cult. If the Pharmacopœia were to fail to meet in a satisfactory manner and to a fair degree the demands of the country and the needs of the government for standards, then its doom as a legal standard would soon be sealed.

There has been a noticeable, even though it has been gradual, coming together of the various recognized schools of medicine and they undoubtedly have much in common in their practices today.

The pharmacopœial convention was originally restricted to delegates from medical societies and medical colleges but with each decennial gathering the representation has been extended so as to include the various departments of the federal service, pharmaceutical societies and schools of pharmacy, and in the recent convention the American Chemical Society, the Association of Official Agricultural Chemists, the Association of State and National Food and Dairy Departments, the National Wholesale Druggists' Association and the National Dental Association were all represented by delegates. As it appears to me there should be no objection to a further extension so as to include the homeopathic medical schools and the homeopathic medical societies of proper standing. There appears to be no valid reason why the homeopaths' requirements for standards could not be covered in the United States Pharmacopœia.

In the ninth revision of the U. S. P., innovations were introduced, such as the chapters on Biological Assays, Sterilization and Diagnostical Reagents and Clinical Tests. It would be no greater innovation for the tenth revision to have chapters such as appear in homeopathic pharmacopœias on the Cleansing of Utensils, Vehicles, Selection of Medicinal Substances, Preparation of Potencies or Dilutions. The various classes of preparations used by the homeopaths, such as triturations, tinctures, solutions, etc., very likely could be treated by general formulas after the plan adopted in the ninth revision of the U. S. P. in fluid extracts and tinctures. A subcommittee on homeopathic standards of the Committee of Revision could readily provide for this part of the revision.

The Homeopathic Pharmacopœia of the United States already gives evidence in a number of its monographs of the desire for a uniformity of standards. Unfortunately some of these references to the U. S. P. are incorrect as they fail to note the changes of the recent revisions. Notable examples of these are seen in the paragraphs on Ferrum Carbonatum, Ferrum Iodatum and Ferrum Muriaticum.

Many changes in the titles and nomenclature used in the homeopathic pharmacopœia would be necessary and the correction of the inaccuracies in the botany and chemistry of the monographs, some of which have already been pointed out,[2] would be greatly to the advantage of the users of such drugs.

The covering of the needs of homeopathy for legal standards by including such in the U. S. P., I do not believe will present any difficulties that will be insurmountable. If such a merger in its entirety be not at present considered as feasible, then there should at least be a joint harmonizing committee representing the committees of revision of both pharmacopœias and this harmonizing committee should be charged with the duty of providing uniform standards for such drugs and preparations as are commonly used in both schools.

[2] *Journal of the American Pharmaceutical Association*, Feb., 1915, p. 208.

PHARMACOPŒIAL STANDARD FOR SODIUM BENZOATE.

By Carl E. Smith.

Inquiries of manufacturers and others, in doubt about a correct interpretation of the standards of purity and strength for sodium benzoate, as laid down in the United States Pharmacopœia, 9th revision, have drawn my attention to several instances of vagueness and deficiencies in the specifications of this important drug. These deficiencies have caused honest doubt in the minds of some and have presented a plausible excuse for others to foist an inferior product on an unsuspecting public.

One of the defects, which are doubtless due to oversight, is the failure to state explicitly that the benzoic acid forming part of the salt must conform to the same standard of purity as that required for benzoic acid itself under its own separate heading. Another is the failure to adequately restrict the water content. Still another is the inadequacy of the assay method prescribed.

It seems self-evident that the Revision Committee did not intend to permit an indefinitely lower standard for the sodium salt than for the acid from which it is made. That would have been grossly inconsistent. In the 8th revision of the U. S. P. it was distinctly stated that the acid separated from the salt must "conform to the tests of purity given under Acidum Benzoicum."

Much benzoic acid contaminated with excessive quantities of chlorobenzoic acid and other impurities is circulating in this market. As this cannot be sold as benzoic acid U. S. P., much of it is likely to be made into the sodium salt, with the impurities remaining in the product, and disposed of under a lax interpretation of the U. S. P. requirements.

In their own and that of the consuming public, purchasers should therefore demand that the sodium benzoate sold as conforming to the U. S. P. standard should not contain any benzoic acid that is below the U. S. P. standard for that acid.

It is a fact apparently little known outside of the factories making this salt that it can hold a considerable quantity of water without showing it, as much as 11 per cent. The texts of the 8th and 9th revisions of the U. S. P. make no explicit provisions concerning permissible water content and ignore the fact that a hydrated salt

exists, but they lead to the inference that the official salt was intended to contain but little water at most. It can be readily seen that a variation of 11 per cent. in strength is considerably beyond reasonable limits, for commercial reasons as well as for medicinal dosage. The British Pharmacopœia of 1914 requires absence of more than 4 per cent. of water. This a perfectly fair restriction and the U. S. P. should have made a similar specific provision.

Experience has shown that general provisions, such as that rather effectively hidden in the Preface of the U. S. P., permitting 5 per cent. of moisture when no special provisions are made, are very liable to be overlooked by those whose duty it is to pass upon the quality of medicinal products.

The official assay method does not with certainty show whether the salt actually contains the required minimum percentage of benzoic acid. It shows merely how much alkali remains after burning off the organic acid or acids in combination with it and does not necessarily indicate the quantity of benzoate present. A direct determination of the benzoic acid, which is the important constituent, is decidedly preferable for that reason, also because of other sources of error in the method. It would be quite possible to adulterate sodium benzoate scientifically with sodium salts of cheaper organic acids in such manner that the fraud would not be detected by means of the U. S. P. tests alone.

5 Beekman Street, New York,
November, 1917.

IODOMETRIC DETERMINATION OF CHLORINE IN CHLORIDES.[1]

By Gregory Torossian.

With the object in view of determining chlorine in chlorides quickly and accurately and without the use of silver nitrate, the well-known method for valuation of the available MnO_2 by iodine was applied. In the determination of the available MnO_2 by iodine the sample is treated with a quantity of hydrochloric acid in a small distilling flask, the liberated chlorine is carried through a glass tubing into a solution of potassium iodide and the liberated iodine is titrated

[1] Reprinted from *The Journal of Industrial and Engineering Chemistry*, August, 1917.

with a $N/10$ sodium thiosulphate solution. In the proposed method for the determination of chlorine in chlorides the sample is mixed with finely powdered manganese dioxide, and treated with sulphuric acid (1 : 1 by vol.) in a distilling apparatus, as in the MnO_2 determination, and the chlorine, produced by the interaction of MnO_2 and the HCl set free from the chloride sample by the action of H_2SO_4, is conducted into a KI solution and the liberated iodine titrated as usual with $N/10$ $Na_2S_2O_3$. In this reaction between sulphuric acid and a chloride in the presence of MnO_2, the chlorine from the chloride is all distilled off, the spent liquor showing no chlorine when tested with $AgNO_3$. The reaction appears to be:

$$2NaCl + 2H_2SO_4 + MnO_2 = Na_2SO_4 + MnSO_4 + 2H_2O + Cl_2.$$

METHOD.

The Reagents Required.—(1) Finely ground MnO_2 (passing 100-mesh sieve).

(2) Sulphuric acid (1 : 1 by vol.) free from nitric, hydrochloric acids, nitrates and nitrous fumes, etc.

(3) Potassium iodide solution, 25 grams per liter.

(4) $N/10$ sodium thiosulphate solution.

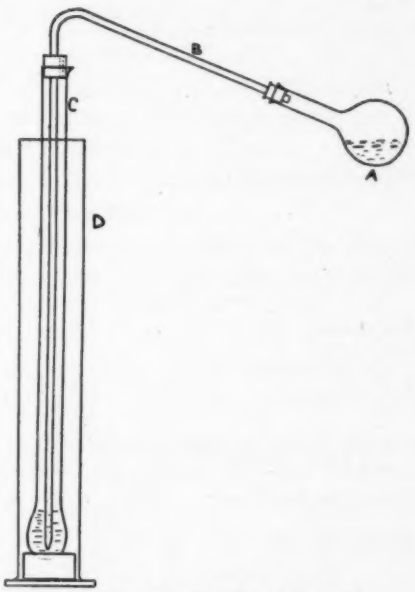
The Apparatus used is the same as in the case of MnO_2 determination by distillation with hydrochloric acid and is shown in the accompanying sketch.

The Sampling in this method is very important. In the case of solids the sample must be finely powdered to insure intimate mixing with the manganese dioxide. If this is not done, there may occur a loss of chlorine during the operation or incomplete decomposition of the chloride. In the case of liquids the sample must be measured from a burette if percentage of volume is required or weighed in the flask directly without adding any water. The amount of sample to be taken for the analysis varies from 0.12 to 5 Gm., depending on the amount of chlorine present. For liquids, from 0.5 to 5 Cc., or weights corresponding to these figures, are taken.

Procedure.—The weighed sample is thoroughly mixed on the weighing glass with about 2 G. of finely powdered manganese dioxide[2] and transferred into the round-bottomed flask *A;* 50 Cc. of sulfuric acid (1 : 1 by vol.) are added and at once the flask is attached to the glass tubing *B,* which is inserted into the larger glass tube *C* containing 100 Cc. of KI solution and surrounded with cold

[2] For larger samples the amount of MnO_2 can be increased.

water in the cylinder *D*. The flask is now slowly heated with a gas burner and constantly agitated, not too strongly, but just enough to keep the contents in motion until boiling. The boiling is intermittently continued, with occasional agitation, for 3 to 5 minutes, when all chlorine is distilled over into the KI solution. The boiling is stopped, the flask quickly removed, and the glass tubing washed, inside and outside, into the main solution, which is transferred into a 600 Cc. pear-shaped flask, then brought to a volume of about 200 Cc. and titrated with a *N*/10 sodium thiosulphate solution previously standardized against pure iodine. One equivalent of iodine is equal to one equivalent of chlorine: 1 Cc. *N*/10 $Na_2S_2O_3$ = 0.003546 Gm. Cl.



Apparatus for the Determination of Chlorine in Chlorides by Distillation.

When a liquid is to be analyzed, the manganese dioxide is simply added to the sample in the flask.

If the chlorine in fluorides is to be determined the procedure is carried out in the same way as for the other samples. Some HF will be evolved; but it has no effect upon the final results and its action upon the glass is negligible.

If the sulphuric acid is free from nitric and hydrochloric acids, chlorides, nitrates and nitrous fumes, and the manganese dioxide contains no impurities capable of decomposing KI on volatilization, the boiling of the sulphuric acid and MnO_2 for over 8 or 10 minutes does not produce any appreciable coloration in the KI solution. The sulphuric acid may be heated to fuming to drive of HNO_3, otherwise a blank test can be run and appropriate correction made. The highest blank consumption of *N*/10 $Na_2S_2O_3$ did not run over 0.2 Cc. in the author's experience and this was due to nitric acid found in the sulphuric acid used.

TABLE I.

Results by Silver Chloride and by Author's Method.
On Basis of 1 Cc. $Na_2SO_3 = 0.0038204$ Gm. Cl.

Material Analyzed.	No.	Per Cent. Chlorine.			
		Calc.	By AgCl.	By I_2.	
Sodium chloride (NaCl)	1	60.66	60.66	60.74	
	2	....	....	60.51	
	3	....	....	60.91	
	4	....	....	70.67	Av. 60.75
	5	....	....	60.73	
	6	....	....	60.87	
	7	....	....	60.81	
Potassium chloride (KCl)	1	47.56	47.52	47.49	
	2	....	....	47.49	
	3	....	....	47.49	
	4	....	....	47.61	Av. 47.53
	5	....	....	47.61	
	6	....	....	47.51	
	7	....	....	47.54	
$BaCl_2.2H_2O$		29.03	28.82	28.95	
$CuCl_2.2H_2O$		41.59	....	41.59	
$CuCl_2.2KCl.2H_2O$		44.45	....	44.67	
Dry cell mixes	1	....	5.78	5.74	
	2	....	5.40	5.49	
Chloride liquors (containing Mn, Zn, NH_4 and Ca)	1	....	17.75	17.65	
	2	....	13.48	13.04	
	3	....	10.92	11.06	
Rare earth fluorides	2	....	0 10	0.13	
	2	....	0.23	0.24	
Manganese ores	1	....	....	0.001	
	2	....	....	0.005	
	3	....	....	0.002	

In Table I are tabulated the results of some determinations of chlorine in chlorides and products containing chlorides by the above method. If values in Table I for sodium chloride, which, by precipitation, gave 60.00 per cent. Cl (the theoretical content), are used for the standardization of the sodium thiosulphate solution, the mean value for 1 Cc. $Na_2S_2O_3$ gives 0.003815 Gm. Cl. and if this value is used to calculate Cl in the potassium chloride (Table I) the following figures are obtained:

Potassium chloride No.:	1	2	3	4	5	6	7	Av.
Per cent. chlorine	47.42	47.41	47.41	47.53	47.54	47.44	47.41	47.46

The figures given in this paper were obtained under the ordinary technical analytical laboratory conditions and no claims of extreme precautions and care are made by the author, but from the results given it is clear that the errors in the determination of chlorine in

chlorides by the iodometric method described above are negligible for most purposes of ordinary laboratory analysis. The sodium thiosulphate solution can be standardized against sodium chloride which previously has been standardized by precipitation with $AgNO_3$, and the mean of the three determinations taken as expressing the strength of the $Na_2S_2O_3$ solution, but the standardization against pure resublimed iodine answers the purpose very satisfactorily.

This method of iodometric determination of chlorine in chlorides is a very simple operation, inexpensive and accurate, and exceedingly quick; the entire procedure from weighing of the sample to the titration of the iodine does not consume more than 15 minutes. By this same method HCl in a mixture of hydrochloric and sulphuric acids can easily be determined without any precipitation.

This method also will serve as a quick qualitative test for ascertaining whether a given sample contains chlorine and the possible amount.

NATIONAL CARBON COMPANY, INC.,
CLEVELAND, OHIO.

A COMPARISON OF AMERICAN AND ORIENTAL STORAX.[1]

BY STROUD JORDAN.

The liquid or semi-liquid balsam obtained from *"Liquidambar styraciflua,"* known in the United States as "sweet gum," has been recognized for a long while and samples were shown at the Paris Exposition in 1878. This material resembles liquid storax of the Levant and shows only a slight variation in composition.[2] It generally occurs in grayish or reddish gray, opaque masses, which harden with age and upon exposure to the air, finally becoming very brittle. The fresh balsam is a clear, yellow-brown, semi-liquid of the consistency of honey and the purified "sweet gum" also exhibits the same characteristics although it is not so fluid as the fresh material. The hardened gum is gathered in certain localities and without further preparation is used as a chewing gum.

[1] Reprinted from *The Journal of Industrial and Engineering Chemistry*, August, 1917.

[2] U. S. D. 1197, 19th Ed.; Gildemeister and Hoffmann, "Volatile Oils," 1, 136; Watts' "Dictionary of Chemistry," 1 (1874), 496.

Large quantities of liquid storax have been imported from Asia Minor where it is gathered from the "Liquidambar" tree (*Liquidambar Orientale*), but scarcely any imports are received at the present time on account of European conditions. This material is used in pharmaceutical preparations, as a source of cinnamic alcohol and concentrated essence of storax, which are used in perfumery as fixatives, and as a general source of cinnamic acid and its compounds. It is unnecessary to go further into detail since this material is described elsewhere.[3]

Since the imports of liquid storax have been practically discontinued it has become necessary to look for American sources and this article is simply a comparison of the American and Oriental storax of commerce, dealing with the crude materials as received. The analyses of storax given below were made on samples which were sold on the New York market from 1912 to 1917, showing the gross adulteration of this material. The sample of "sweet gum" analyzed was gathered in Durham County, North Carolina, during March, 1917, and the genuineness of this article can be guaranteed. An average analysis of "sweet gum" is given, which will vary from time to time, according to locality and condition.

Method of Analysis.

The general methods of analysis used are given in "Resins, Balsams and Gum Resins," by K. Dietrick, page 233, 1901.

In addition to the above analysis, the method as outlined in *Chemical Abstracts*, 2 (1908), 2845, for Peruvian balsam, has been followed out in some cases, as a comparison.

Results.

The following values have been obtained from the samples of crude storax and "sweet gum" examined:

No discussion of the storax analyses will be attempted since there is not a first-class sample in the entire lot. It will be sufficient to point out the wide variations, especially in Nos. 2, 11 and 12, which were grossly adulterated with colophony. It will appear, however, that "sweet gum" compares favorably with liquid storax, especially

[3] E. J. Parry, "Food and Drugs," p. 492; U. S. D. 1197, 19th Ed.; Gildemeister and Hoffmann, "Volatile Oils," 1, 136; K. Dieterich, "Resins, Balsams and Gum Resins," p. 225; Watts' "Dictionary of Chemistry," 1 (1874), 497.

ANALYSES OF COMMERCIAL STORAX AND OF "SWEET GUM."

Material.	Volatile Matter.	Ash.	Ether Insoluble.	Alcohol Insoluble.	Cinnamene.	Resin Esters.	Resin Acids.	Cinnamic Acid.		Acid No.	Sapon. No.	Ester No.
								Free.	Total.			
Storax No. 1.....	....	...	5.18	...	39.30	24.24	8.22	5.41	....	54.5	145.0	90.5
2.....	....	...	2.16	...	25.89	1.00	53.35	1.87	....	80.5	133.0	52.5
3.....	....	...	4.88	...	31.75	14.87	15.83	3.60	....	....	....	....
4.....	20.35	1.66	7.01	...	34.03	12.32	12.01	7.21	....	52.6	145.4	92.8
5.....	....	...	7.12	...	39.19	21.27	3.01	5.19	....	....	....	....
6.....	....	0.28	3.68	3.68	54.90	18.79	2.63	7.69	....	59.5	166.2	106.7
7.....	....	...	3.24	3.25	51.39	9.42	13.22	8.14	....	60.9	153.8	92.9
8.....	27.64	1.48	7.98	7.98	35.12	2.58	22.30	3.73	....	42.2	148.9	106.7
9.....	23.49	4.48	5.17	5.02	37.34	9.75	16.74	5.57	....	50.3	115.7	65.4
10.....	....	...	...	...	....	....	....	....	....	99.3	127.3	28.3
11.....	....	...	...	...	....	....	54.76	....	3.19	100.4	135.4	35.0
12.....	....	...	...	...	....	....	55.10	....	1.65	91.2	134.8	43.6
"Sweet gum".....	22.37	0.32	5.24(*a*)	6.64(*a*)	22.86	34.76	2.11	12.65	28.02	68.7	131.6	62.9

(*a*) These insolubles were taken on different portions of the sample. The difference is due to the varying proportion of mechanical impurities and the alcohol insoluble on the same portion would show a smaller percentage than the ether insoluble.

at the present price which ranges from $5.00 to $10.00 per pound with practically no offerings. Under normal conditions liquid storax will average about $0.20 per lb., but even then it is the worst adulterated material ever examined in our laboratory, being adulterated with Burgundy pitch, colophony, castor oil and extracted storax. At $0.20 per pound American storax cannot compete, unless some cheap method of production can be worked out; the Forest Service is now busy on this problem. It is believed, however, that this material can be obtained for $0.50 to $1.00 per pound and that after a market is found the supply may warrant a material reduction.

Conclusion.

It would seem that "sweet gum" may be used in the place of liquid storax with good results; that it carries more cinnamic acid than commercial storax; that the odor and fixative properties of "sweet gum" are superior to the commercial variety of storax imported into the United States; that the southern portion of the United States should furnish all the storax required; that the old hardened balsam may be used in the manufacture of chewing gum.

Chemical Department, American Tobacco Company,
60 Franklin Avenue, Brooklyn, N. Y.

QUARTERLY REVIEW ON THE ADVANCES IN PHARMACY.

By John K. Thum, Ph.M.,
Lankenau Hospital, Philadelphia.

Use of Saccharine in France.—At a recent meeting of the Therapeutic Society a discussion on the use of saccharine brought forth some interesting conclusions. The consensus of opinion was that in the present state of the sugar supply the employment of a mixture of one part of saccharine to one thousand parts of glucose should be allowed as a substitute for sugar. But its use in any other form such as in chocolates, jam, and other dietetic articles should be absolutely prohibited. It was also decided that its use in any product destined for infants, invalids and convalescents should also be absolutely forbidden. It was also deemed of great importance to rigorously insist that the presence of saccharine should

always be indicated whenever it is employed (*J. Pharm. Chem.*, 1917, 16, 61, through *The Pharm. Jour. and Pharmacist,* Sept. 1, 1917).

METHYL-RED AS AN INDICATOR.—Chemically this substance is known as *p*-dimethyl-aminoazobenzene-*o*-carboxylic acid, and is generally used in 0.2 per cent. solutions. It is much more delicate as an indicator than methyl-orange and for this reason is much more desirable to use when titrating with centinormal acid. When carbonates are present, heat is necessary, the carbon dioxide liberated behaving like an acid. It has been found that for determining the alkalinity of industrial waters there is no better indicator. Experience has also shown that it can be used very successfully in the estimation of oxalic and picric acids, and for alkali borates and cyanides. The change from red (acid) to yellow (alkaline) and the reverse being quite sharp (*Arch. Pharm.*, 1917, 255, 113–119, through *The Pharm. Jour. and Pharmacist,* Sept. 1, 1917).

JAPANESE ARTIFICIAL INDIGO.—According to a news item appearing in one of the recent pharmaceutical publications, a new process for the production of artificial indigo has been discovered in Japan. Before the war Japan, like many other countries, depended on Germany for this most important commodity, but this makes it probable that she will in the future be able to produce all that she needs. The discoverer is Dr. Kariya, at one time Professor in the Medical College of the Imperial University.

In this connection is may not be amiss to remark that considerable work is being done to improve the indigo plant with the purpose of increasing the yield. It is said that the methods of manufacture of indigo from the plant could be much improved upon.

A NEW REAGENT FOR ATROPINE, HYOSCYAMINE, AND SCOPOLAMINE.—A trace of either one of these drugs warmed on a watch-glass with a drop of a solution of two grams of *p*-dimethylamido benzaldehyde in six grams of sulphuric acid and 0.4 gram of water gives an intense red coloration which soon passes to a violet color. Cocaine, novatropine, and tropacocaine give no reaction at all. Other alkaloids give colors but not the same as the atropine group (*Ztschr. Anal. Chem.*, through *Schweiz. Apoth. Zeitung,* Feb. 15, 1917, through *The Pharm. Journ. and Pharmacist,* Aug. 25, 1917).

MEDICINAL PLANT CULTIVATION IN GOTHLAND.—It is said that this island is ideally situated and that the climate is comparatively

mild and dry. Among the plants cultivated were the following most important ones, drugs that at the present time are very scarce and upon which medicine largely depends for results in the treatment of disease: *Althea officinalis, Atropa Belladonna, Datura Stramonium, Digitalis purpurea, Hyoscyamus niger, Papaver somniferum,* and *Valeriana officinalis.* Five hundred poppy capsules yielded nine grams of dried latex which contained 4.6 per cent. of morphine. Valerian root was readily grown and in sufficient quantity to be profitable. In the cultivation of this plant it was found that if the flowering stems are removed the root system becomes strongly developed. A number of other plants were also cultivated experimentally and show promise of adding to or increasing the drug supply of the world (Lybing in *Svensk. Farm. Tidskrift,* through *Schweiz. Apotheker Zeitung,* 1917, p. 119).

A Simple and Rapid Method for Destroying Organic Matter in the Detection of Arsenic.—The method outlined is recommended as preferable to those usually followed for the destruction of organic matter in examinations for minute traces of arsenic. The organic matter is heated to a temperature of 300° C. until it is charred; it is then mixed in a mortar with 2 or 3 per cent. of its weight of pure calcium oxide; water is then added to slake the lime. The mixture is then transferred to a flat porcelain dish and heated at a dull redness until the ash is white or grayish. It requires no special attention: all the organic matter will be burnt off in an hour or two. When cool the ash is then mixed with water acidified with sulphuric acid, boiled, filtered, evaporated till fumes appear, then diluted with 8 to 10 volumes of water and introduced directly into the Marsh's apparatus (*Comptes rend.,* 1917, 165, 11, through *The Pharm. Jour. and Pharmacist,* Aug. 25).

Identification of Emodin-Containing Drugs.—The importance of some reliable method of identifying emodin-containing drugs cannot be overestimated. Nothing is more baffling to either the chemist or pharmacist than to be called upon to identify pharmaceutical preparations of these sort of drugs. For this reason this paper is peculiarly valuable.

Of liquid preparations, 10 mils are evaporated to a pilular consistence, made acid with either HCL or H_2SO_4, and the residue extracted several times with ether. Solid material is powdered, acidified, and extracted with ether. The addition of ammonia or

dilute alkali causes the formation of a red color in the water layer if emodin or other anthraquinone compounds are present. The color developed by phenolphthalein disappears in the course of an hour or so in the presence of a five or ten per cent. potassium or sodium hydroxid solution, while that of anthraquinone compound is permanent.

Aloes can be identified by the fluorescence occasioned by the addition of saturated aqueous solution of sodium borate, and this no matter what combination of emodin-containing drugs may be present. Rhubarb occasions a deep rose color with sodium borate, and cascara a brown, senna sometimes gives a light brown, but generally no color is produced. Rhubarb can be distinguished by obtaining a positive reaction with both bleaching powder (red) and iron sulphate (blue) solutions; so far as is at present known no other substances will give both reactions. As mentioned above cascara is distinguished by the brown color imparted to the water solution by sodium borate, provided the two tests for rhubarb are negative. It is likewise possible to identify cascara in any combination of emodin-containing drugs if rhubarb is absent. Senna is the hardest to detect but is distinguished by its failure to respond to any except the Borntrager reaction. This reaction is the phenolphthalein test mentioned above. Experience shows that it is sometimes difficult to get senna to respond even to this test, and this may be due to the fact that glucosides of the anthraquinone compounds are present in larger amounts than the compounds themselves. It has been found that senna cannot be distinguished in combination with any of the drugs. The fluorescence sometimes brought forth by cascara solution need not be confounded with aloes, as that brought forth by cascara has a brown color. An aqueous solution of the following chemicals on ether extractions of these emodin-containing drugs brought color reactions as follows:

Ammonium Thiocyanate—

Senna: Yellow to brownish color in water layer.
Rhubarb: Yellowish color in water layer.
Cascara: Brownish to rose-red in water layer.
Aloes: Red in ether and brown in water layer.

Ammonium Molybdate—

Aloes and Cascara: No color change.
Rhubarb: Mahogany brown in water layer.
Senna: Very light brown to yellowish in water layer.

Uranium Acetate—

Aloes, Cascara, and Senna: No color change.

Rhubarb: Reddish mahogany color in water layer.

Ammonium sulphate, persulphate, and oxalate bring forth no color changes (*J. Ind. and Eng. Chem.*, 1917, 9, 518–521, through *The Analyst*, vol. 47, p. 277, W. S. Hubbard).

HYDRASTIS CANADENSIS.—It is reported that this exceedingly valuable drug plant is now being successfully grown in Austria. Careful examination shows that the yield is of very much better quality than was expected, and that the drug is the equal or even the superior of the American-grown plant; this statement is justified because of its greater alkaloidal content, which after all is the only fair criterion (*Pharm. Zeitung*, vol. 62, 104, through *The Pharm. Jour. and Pharmacist*, July 21, 1917, p. 29).

AMERICAN SYNTHETICS.—The Council on Pharmacy and Chemistry, assisted by such support as the American Medical Association chemical laboratory can give, announces that it will undertake the task of making a study of the quality of American-made synthetics. Important unofficial synthetic drugs submitted by their manufacturers will be examined and later, when these drugs are placed on the market, the Council will make purchases and report on their purity. The Council is also willing to examine specimens of American-made drugs when submitted by dealers, provided the origin of these specimens is made known. Such control of synthetic drugs now made in this country because of war conditions will not only safeguard the public, but will in reality be of great service to those engaged in this industry, an industry necessarily as yet in the experimental stage (*Jour. A. M. A.*, Sept. 22, 1917, p. 1018).

HALAZONE.—Chemically this substance is parasulphonedichloramidobenzoic acid. It is said to be powerfully germicidal and is mainly recommended as a safe and ready means of sterilizing water. It is said to act like chlorine but to have the advantage of being stable in solid form. Dakin and Dunham report that in the presence of alkali carbonate, borate and phosphate, this chemical in the proportions of 1:200,000 to 1:500,000, and in from thirty to sixty minutes' time, sterilized polluted water contaminated with the following microörganisms: *Bacillus coli, Bacillus typhosus, Bacillus paratyphosus A* and *B, Cholera vibrio* and *Bacillus dysenteriæ.*

Dosage: This chemical is commercially available in the form of tablets combined with sodium carbonate (or sodium borate) and sodium chloride; one of these tablets containing from 0.004 to 0.008 Gm. of the active chemical is added to a liter of water.

It is a white powder having a strong odor of chlorine. It is slightly soluble in water and chloroform; insoluble in petroleum ether; soluble in glacial acetic acid, benzene, and with the formation of the salt in alkali hydroxide solutions. Crystallizes in stout prisms from glacial acetic acid. When pure the melting point is 213° C. Parasulphonedichloramidobenzoic acid was first made by Dakin and Dunham (*British Medical Journal,* May 20, 1917, p. 682) under the name "Halazone." It is prepared by oxidizing paratoluenesulphoneamid to parasulphoneamidobenzoic acid and chlorinating the latter. It liberates iodin from neutral solution of sodium iodide and bromine from a neutral solution of sodium bromide. The available chlorine content is 26.2 per cent. and should not be lower than 24 per cent. (*Jour. Amer. Med. Assoc.,* Oct. 6, 1917, p. 1166).

AMBRINE.—This much advertised French preparation which has been recommended so highly for burns consists principally of hard paraffine, to which its efficacy is entirely due. Like many proprietary preparations of a secret nature its composition is not always constant. It consists essentially of a hard paraffine combined with a small quantity of an asphalt-like body and to which combination a fatty oil has been incorporated. Undoubtedly a number of commercial paraffines on the market, even without admixture of other substances will be found to answer just as well, in fact some observers have found them decidedly superior to ambrine. There is no reason why a simple paraffine wax, with a melting-point of between 44° and 48° C., should not answer every requirement for making these paraffine films (*Jour. Amer. Med. Assoc.,* vol. 68, p. 1497).

SPARTEINE MORE SOLUBLE IN COLD THAN IN HOT WATER.—It has been noticed that sparteine becomes less soluble in water as the temperature rises. The least elevation of temperature in a solution saturated in the cold causes a turbidity which rapidly disappears on cooling. It has also been noticed that the presence of sodium carbonate adds to the sensitiveness of the phenomenon to such a degree as to afford a delicate test for the identification of the base. To identify sparteine sulphate the test which follows is suggested: A

ten per cent. solution of this salt in water is made at ordinary temperature, it is then mixed with an equal volume of a ten per cent. solution of sodium carbonate. The tube containing this mixture is then rapidly immersed in a water-bath which has been heated to 40° C., the solution becoming at once milky. On immersing the tube in cold water the solution again becomes clear (*J. Pharm. Chim.*, 1917, 15, 359, through *The Pharm. Jour. and Pharmacist*, Sept. 8, 1917).

QUICKSILVER.—According to a recent news report the output of quicksilver in this country for the last year shows a considerable increase. The increase of last year over the previous one is over three times. In 1915 the output was 8,899 bottles of 75 pounds each and the succeeding year 29,932 bottles. There seems to be a resumption of activity in many of the old established mines, and experiments are being made with a view of recovering metal that was formerly lost. Experiments are also being made to increase the yield from low-grade ores and dumps. Of this total output Texas contributed 6,306 bottles, all from shaft-furnaces, while most of the old mines were reopened, some under new management, to take advantage of the higher prices. The output from Nevada was 2,198 bottles, and in Arizona, Oregon, and Washington only 383 bottles were obtained. In 1916 this country exported 8,880 bottles, the greater part of which went to England and Japan, in equal quantities. Only 5,659 bottles were imported, the most of which came from Spain and Italy, chiefly through the port of New York. The average monthly price rose to as high as $295 per bottle in February, in which month as much as $400 per bottle was obtained for small lots. In June the price took a violent tumble, it reaching the low price of $74.50. In the last half of the year the average price (that is to say monthly price) varied between $81.20 and $74.50 per bottle. At the present time the price is in the neighborhood of $105 per bottle.

ESTIMATION OF ANTIPYRINE.—The procedure described below for the iodometric estimation of antipyrine is said to give satisfactory results. The methods are both volumetric and gravimetric. With the volumetric method 99.6 per cent. of the antipyrine present is accounted for: 10 mils of an aqueous one per cent. solution of antipyrine are treated with 1 gram of potassium bicarbonate and an excess of $\frac{N}{10}$ iodine solution; after one hour the mixture is acidified

with one mil of acetic acid, 10 mils of chloroform are added, and the excess of iodine is titrated with thiosulphate solution. Two atoms of iodine combine with one molecule of antipyrine. The gravimetric method is as follows: A half gram of antipyrine is dissolved in 50 mils of distilled water, two grams of potassium bicarbonate are added and concentrated iodine solution is added drop by drop; the brown turbidity which is produced by the addition of each drop should disappear before the next drop is added. The addition of the iodine requires about thirty minutes. Colorless crystals of iodoantipyrine begin to form in about ten minutes, and are colored black as soon as an excess of iodine has been introduced. At the end of an hour the mixture is decolorized by the addition of sodium thiosulphate; the resulting precipitate is collected on a filter, washed with a small quantity of distilled water, dried, and weighed. A quantity of iodoantipyrine remains in solution and this is extracted with chloroform. It is asserted that 99 per cent. of the antipyrine actually present is found by this method (*J. Pharm. Chim.*, 1917, 15, J. Bougault, through *The Analyst*, vol. 47, 276).

PHENOLPHTHALEIN REAGENT FOR THE DETECTION OF BLOOD IN URINE.—A modification of Meyer's reagent, sodium hydrosulphite being substituted for the zinc dust, is recommended as a reliable test for the recognition of blood in urine. Two grams of phenolphthalein and twenty grams of potassium hydroxid are dissolved in 130 mils of water and the solution is boiled with the addition of 3 grams of sodium hydrosulphite until colorless. To detect blood in urine, 10 mils of the urine are mixed with 10 mils of alcohol containing 2 per cent. of acetic acid, and 4 mils of the reagent, to this mixture a few drops of hydrogen peroxide are added; the presence of blood brings forth a more or less intense red color on the addition of the hydrogen peroxide (*J. Pharm. Chim.*, 1917, 16, E. Justin Mueller, through *The Analyst*, vol. 47, 280).

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THE DECOMPOSITION OF QUININE BISULPHATE.[1]

By Bernard F. Howard, F.I.C., and Oliver Chick.

The tendency to utilize the more soluble salts of quinine in the place of the sulphate, both for administration and also for hypodermic injection, was becoming very marked before the war. Since 1914, however, the increase in the use of the bisulphate, hydrochloride, and bihydrochloride has been phenomenal, and the time is obviously not very far distant when "quinine" will cease to be a synonym in pharmacy for the sulphate, and this will gradually fade into obscurity as one of the less useful salts. The authors of the present note wish to point out a certain property, noticeable in the bisulphate, but not in the sulphate, hydrochloride, or bihydrochloride which, owing to the increase in the popularity of the former, is of considerable interest to pharmacists and medical practitioners at the present time, namely the ease with which quinine as bisulphate is converted into quinicine, an alkaloid possessing a therapeutic value undoubltedly differing from that of quinine, and according to several authorities, actually harmful, the name quinotoxin having been used as a synonym for quinicine. This property of quinine bisulphate is no new phenomenon. Pasteur, in 1853 (*P.J.*, p. 373, and *Compt. Rend.*, XXXVII, p. 162), described the preparation of quinicine by heating quinine sulphate with water and a little sulphuric acid to 120—130° C., when the conversion of the quinine into quinicine was complete. David Howard (*P.J.*, 1872, p. 765) proved that the quinicine obtained by Pasteur was identical with the alkaloid that can be isolated from amorphous quinoidine. Hesse (*Annalen der Pharm.* 1875, vol. 178, p. 244) by heating quinine bisulphate alone to 135° C. completely converted it into quinicine. Turning to the Pharmacopœias, we find either a complete silence or a considerable divergence of opinion as to the "dangerous temperature" for the salt. "Codex Francais, 1908," mentions that it melts at 80° C. in its water of crystallization, and that if exsiccated it melts at 135°, being converted into quinicine. "U. S. Pharm. IX," 1 (and the "Pharm. Ned.") gives no melting point, and no mention of decomposition. "Pharm. Jap. III" gives melting point

[1] Paper accepted by the British Pharmaceutical Conference for publication in the Year-Book 1917, and reprinted from the *Pharmaceutical Journal and Pharmacist.*

of 80° C., but no mention of decomposition. "Brit. Pharm. Codex. 1907" states that the salt softens at 60° C., is semi-fluid at 70° C., melts at about 160° C., with decomposition, being converted into acid quinicine sulphate. It is curious to observe that the P.B. is one of very few official Pharmacopœias which fail to include this highly important salt. It should also be noted that in all the authorities above quoted the lowest temperature mentioned at which decomposition occurs is 120° C. The present authors consider that the uncertainty with regard to the actual temperature of decomposition is highly unsatisfactory and actually misleading, as it might be presumed that no decomposition would take place at any temperature *below* those limits mentioned in the authorities stated above. This, however, is not the case, and it has been found that decomposition will occur at very moderate temperatures, and under conditions which might be used (unless warning was given) in the preparation of a solution of the bisulphate for hypodermic injection. The "U. S. P. IX," p. 616, in describing "sterilization," recommends the heating of the solution to 115—120° C. The sterilization of a 10 per cent. solution of the salt at this temperature for thirty minutes actually caused 5 per cent. of the alkaloid to be decomposed into quinicine. A large number of experiments have been carried out with the salt to ascertain the dangerous temperature at which decomposition would occur. In each case the amount of decomposition was ascertained by separating the unchanged quinine from the quinicine in the following manner:

The mass, after being submitted to a constant heat for twenty-four hours, was dissolved, the boiling solution neutralized with ammonia, and the unchanged quinine sulphate crystallized out on cooling. This was filtered, dried and weighed. The quinine remaining in the mother liquor was obtained as tartrate by the addition of sodium potassium tartrate to the filtrate. The small amount of tartrate so obtained was weighed; the weight added to the quinine sulphate, giving the total quinine sulphate remaining unchanged. This value was converted into bisulphate by the factor 1.244, and, by deduction from the original weight of bisulphate, the percentage loss due to conversion into quinicine obtained. The quinicine was removed from the tartrate mother liquor by precipitation into ether, and identified by the melting point (60° C.), the specific rotation in chloroform (+44°), and the formation of insoluble thiocyanates and hypochlorites. The following conclusions have

been arrived at: (1) The exsiccation of quinine bisulphate at a safe temperature (*e. g.*, 35°–40° C.), before submitting to higher temperatures, *raises* the limit of temperature at which decomposition is first noticed. Whereas quinine bisulphate $C_{20}H_{24}N_2O_2$, H_2SO_4, $7H_2O$ decomposed to the extent of 0.25 per cent. at 60° C., the exsiccated salt showed no decomposition at this temperature. (2) The addition of a *small* quantity of water (*e. g.*, half its own weight) at any dangerous temperature *increases* the amount of decomposition, whilst a *larger* quantity of water under similar conditions *retards* decomposition. The period of heating was twenty-four hours in all cases.

TABLE *A* AT 60° C.

Weight of bisulphate.	Weight of Water.	Per cent. of quinine converted into quinicine. Per cent.
10 grams	nil	0.25
10 "	5 grams.	4
10 "	10 "	0.1
10 "	20 "	nil

TABLE *B* AT 90° C.

10 grams	nil	50
10 "	5 grams.	35
10 "	10 "	19½
10 "	20 "	18½
10 "	30 "	15½
10 "	40 "	13
10 "	50 "	10½
10 "	100 "	5

(3) The dangerous limit of temperature at which quinine bisulphate heated alone, or in very strong solution for twenty-four hours, first shows decomposition was found to be 60° C. Above this point decomposition increased, and at 90° C. it amounted to 50 per cent. in twenty-four hours and 75 per cent. in forty-eight hours. If the water of crystallization is allowed to escape (*i. e.*, if the treatment is not carried out in a closed vessel), the amount of decomposition was reduced to 17 per cent. in twenty-four hours, owing to the exsiccation of the salt and consequent raising of the dangerous limit of temperature. (4) It is very doubtful if melting of the hydrated salt can ever occur without decomposition. (5) In all cases where decomposition occurred, a bright yellow coloration of the "melt," giving a highly colored, very refractory solution was noticed, and this may be considered a certain indication of decomposition.

We think that we have shown clearly that a danger existis in heating strong solutions of quinine bisulphate for any medicinal or pharmaceutical purpose, such as is directed for the preparation of solutions for hypodermic injection. As this danger does not exist in the case of the much more soluble bihydrochloride, or bihydrobromide, or the somewhat less soluble hydrochloride, we would suggest that it would be a wise step if one of these salts were invariably used where it may be necessary to heat the quinine salt for any such purpose before administration.

THE TRIPLE ALLIANCE IN MILITARY MEDICINE.[1]

By J. Madison Taylor, M.D., Philadelphia, Pa.

The domain of military medicine is a blend of three major components or subjects: medicine, dentistry and pharmacy, with sanitation and hygiene essential factors of each; veterinary surgery is a branch. As to which one of these three departments of human welfare effort shall be esteemed paramount, there may be justifiable variants of opinion. There can be no question but each is on a practical par with the other in the objects they aim to achieve.

The first line of defense is the medical corps, for the reason, they it is who pick the fighting men as no others can. Without this critical selection there would come together a mere herd of dubious candidates—most expensive to the government by reason of potential defectives and dependents. The second line of defense we may safely claim is also the military surgeons, because theirs is the responsibility of putting these men in conditions of highest efficiency, of keeping them there, of forefending them from all preventable decrepitudes, of repairing them when damaged and of restoring them to the trenches, of reducing to a minimum their dependence upon either the government pay rolls or the public charge. Can you beat that for a man's sized contract?

In the process of preventing the preventable depreciation of life and vigor and fighting power, the medical corps must qualify as

[1] Read before a joint meeting of the National Pharmaceutical Service Association and the Philadelphia Branch of the American Pharmaceutical Association, November 13, 1917, and offered for consentaneous publication in the *New York Medical Record* and in the *Journal of the American Pharmaceutical Association*, and *The American Journal of Pharmacy*.

ceaselessly vigilant, first-class experts in testing all suspicious objects, sources of lurking perils among which are drinking water, foods, soils, infective agencies, environments, climates, dwelling or sojourning sites, whether outdoors or indoors or in a ship. There is included demand for expertness in chemistry, in bacteriology, in all the departments of clinical laboratory proficiencies. The time and strength and multitudinous demands made on the surgeon, notably in time of active participation in war, bring him to the verge of overstrain and then he absolutely must have expert help because he cannot do it all and act as administrator beside.

Frankly the development of military medicine has long outgrown the archaic and wholly unsatisfactory methods and practices of even as late as 1898 and demands complete readjustment in certain particulars.

The one outstanding deficiency is in the domain of expert pharmacy. All demurrers, all hesitation to supply full quota of modern pharmacists, can be met by making clear what he is now uniformly trained to supply, viz., expert knowledge in physiologic and pathologic (medical) chemistry, proficiencies in laboratory tests of urine, feces, gastric contents, of blood Wassermann, Widal, etc., and transfusions of blood, intravenous treatments, surgical dressings and diverse allied subjects and facilities; also examination of drinking water, foods, soils, localities, drainage, details of sanitation, also in diverse clinical laboratory manipulations at least as to details of matters to which the surgeon may be wholly unable to do justice.

There is therefore fullest justification for a triple alliance between surgeons, dental surgeons and expert pharmacists; otherwise the practical efficiency of the fighting, the executive and the financial personnel, must indubitably and seriously suffer.

The status of pharmacy as a profession in this country lacks much of what it deserves largely through the neglect or apathy of the profession of medicine and one reason is the crass commercialism which still lingers in her territories. Now pharmacy is just as much a profession *per se* as any other high-class industry progressing on a plane of lofty ethics and strict scientific conditions.

Pharmacy is as full a correlate of medicine as is dentistry or veterinary surgery, and her proponents are qualified to enjoy full recognition of the military and other bureaus. And yet to-day the medical profession, or corps, in the military service, fails to give scientific pharmacy that just encouragement and support essential

not only for its best growth and development but also for acting as the cordial handmaid, contributing to the solidarity of medicine as a whole.

Not more so-called pharmacists are needed in the service but *real ones,* trained in the full scientific, as well as practical methods now demanded of students in the better schools of pharmacy. Indeed the use of drugs has notably diminished of late because of the increasing efficacy of preventive and reconstructive measures.

The number of drug stores, apothecary shops or pharmacies are rapidly becoming more numerous than needed, yet they are of much use and the proprietor must live, hence the temptation to deal in nostrums and blatantly overpraised objects correlated with remedies. The correction of abuses it would seem might be affected by a greater sympathy and mutual appreciation of the domain of each, especially when the pharmacist is called upon more to exercise his skill as chemist, analyst, laboratory clinician and in other ways to coöperate in the day's work of the physician. The scientific spirit among pharmacists is absorbing attention, devotion and increasing personal sacrifices with great speed and force.

My interests in therapeutics are in other measures than drugs, yet for years I have been impressed by the splendid research work that the American Pharmaceutical Association has been doing for our benefit, quietly, unobtrusively, honestly and practically unknown to the medical profession. This is set forth candidly in the annual report on the Progress of Pharmacy in its exceedingly able *Journal;* also the research work of the splendid *American Journal of Pharmacy* for nearly a century past; these publications embracing thousands of pages of scientific matter better known and appreciated in foreign countries, I believe, than it is in our own.

It seems to me that the time has come for full correlationships in which the medical profession should do all in its power to get shoulder to shoulder with its sister professions. The first step could well be that advocated by the *Journal of the American Medical Association* when it urges the recognition of pharmacy as a profession by the medical department of the U. S. Army and Navy. Such a recognition would go a long, long way toward placing the practice of pharmacy in this country in a satisfactory position to the world and to demonstrate its effectiveness.

What stands in the way? Apparently the attitude of the surgeon-general of the Army who has expressed himself as opposed to

the recognition of professional pharmacy in the Army as being "unnecessary" and, second, that if recognized it might necessitate the manufacture of medicinal preparations by Army pharmacists, and this would "offend" the large manufacturing pharmacists of the country who furnish the medical supplies. The surgeon-general is a man of deep penetration; in this instance, however, he has not given the subject the attention it deserves. When he does he will be more liberal and appreciate the present status.

It is claimed little or no place exists in military medical practice for the use of drugs, that the vital issues are surgical and sanitarial, and that drugs "if" (or when) needed, can be met by the use of "ready to use" products, tablets and the like, conveniently handed out by physicians, or by privates with little or no special training.

The answer to this is, of course, that proper results in clinical work cannot be attained without proper and adequate tools. One might as well urge that the Army surgeon should use "First Aid Packets" *only* in the surgical handling of the wounded, as to say that the military surgeon should be supplied only tablets for the treatment of diseased conditions.

The men of the trenches, God bless them, are entitled to the best possible pharmaceutical skill as well as other skill when ill, fully equivalent to what is available in civil life. Less than this is rank injustice or worse.

In normal times the fighting man, it is true, requires little medical treatment, and, also, probably during the first year of a war, but when bodies of our boys are wrecked and being repaired surgically, however skillfully done, diseased conditions supervene. In a short time all army hospitals will be filled to overflowing, not only with surgical, but also with medical cases demanding highest medical skill to reclaim. Why then should not our men have the best pharmaceutical skill to make more effective medical skill?

So far as the second objection of the surgeon-general is concerned, Editor Mayo of the *American Druggist* is in the right when he says there is no foundation for the fear expressed of venality. The first-class manufacturing pharmacists of this country are as patriotic as any other group. The amount of government business they receive, in comparison with their general and regular business, is exceedingly small. It is more than probable that the government contracts afford them negligible profits. They might be glad for relief from the business. Their services and their products are offered not for revenue only, but from patriotism.

I need only mention here the enormous assistance that the pharmacists as now taught and trained could be to medical men not alone along pharmaceutical, chemical, toxicological, bacteriological, but in X-Ray and other lines. I have emphasized this in a paper published recently in the *New York Medical Journal.*

H. R. Bill 5531 introduced by Representative The Hon. Geo. W. Edmonds of Philadelphia in the House of Representatives on July 25, 1917, is an excellent and important one, and I believe that this bill covers the field comprehensibly and creditably. Doubtless it may need amendment in technical military details to meet the needs of the Army and Navy.

I express the hope and believe that the "brief" filed with Surgeon-General Gorgas by the pharmacists on August 10, 1917, will receive sympathetic attention. This extraordinarily able official could perform no act of public service more to the benefit of the medical department and his credit than the recognition of skilled, highly trained professional pharmacists, by supporting H. R. 5531 as an administration measure. His predecessor, Surgeon-General Torney, had established the dental corps and the veterinary corps. It would be peculiarly fitting if Surgeon-General Gorgas could have established the pharmaceutical corps.

PROPOSED ORGANIZATION OF UNITS FOR PROMOTING THE BILL BEFORE CONGRESS, KNOWN AS THE EDMONDS BILL FOR SECURING AN ARMY PHARMACEUTICAL CORPS.[1]

By Dr. F. E. Stewart, Philadelphia.

You are already familiar with the Edmonds Bill now before Congress, having as its object the establishment of a pharmaceutical corps in the United States Army. You know that one of the objects in organizing such a corps is to lessen the strain imposed by the war upon the medical department—a strain that is bound to increase as the war goes on.

[1] Read before the joint meeting of the National Pharmaceutical Service Association and the Philadelphia Branch of the American Pharmaceutical Association, Nov. 13, 1917.

Although the medical profession is by far in the lead of all others in responding to the country's urgent need, over 16,000 being enrolled at the present time, the fact remains that this figure already represents a large proportion of those fully qualified by physical condition, age, etc., to become medical officers that are still available. If the great armies now in course of formation, and others in prospect materialize, a deficiency of trained surgeons cannot but become manifest.

How shall this great shortage in physicians for the United States Army be met? Shall it be met by conscription? If the physicians of the country be largely drafted into the Army, what will become of the civil population? Is it necessary to sacrifice the civil public to meet army requirements? We believe that much of the sacrifice is unnecessary. We believe that the Edmonds Bill is a partial solution of the problem. Numerous duties now performed by physicians in the Army could be just as efficiently carried out by trained pharmacists, and the establishment of a pharmaceutical corps in the United States Army would provide a body of men not only educated and trained in our schools and colleges of pharmacy as pharmacists, but in many instances trained as business men also, and therefore especially qualified to aid the medical department.

To establish a pharmaceutical corps in the Army requires Congressional action. But why wait for Congressional action? Why not at once organize local pharmaceutical corps units in connection with our pharmaceutical schools and colleges? I am officially instructed by the executive committee of the National Pharmaceutical Service Association to present this suggestion for discussion this evening in connection with Dr. J. Madison Taylor's excellent paper based on work already being carried out successfully by the three scientific schools, medical, dental, and pharmaceutical, of Temple University of Philadelphia. Briefly, this organization of students and instructors, under the command of Dr. C. E. de M. Sajous, a retired militia officer, aims to give medical and dental graduates a comprehensive military education, and provides its pharmaceutical students such practical knowledge as will enable, them to assume many of the duties now imposed upon the surgeon, thus permitting the latter to devote all his time to sufferers. It is obvious that in such circumstances a smaller number of surgeons would be required. This Medical Reserve Cadet Corps as it is called, is conducted on rigid

military lines, and in accord with the regulations of the United States Army.

As you know, the law already provides for the organization of Home Defense Corps. The organization and practical working of units with the adequate preparation of pharmaceutical students might be of decided value in crystallizing ideas and suggestions, and the successful working of the plan would encourage Congress to act favorably if it is found impossible to receive favorable action by the next Congress.

The training required to fit physicians for the medical department of the Army includes a regular drill of the same kind required of every soldier, no matter to what corps he is assigned. In addition to this drill, there are lectures and practical instruction in taking care of the sick and wounded and preventing disease. A certain amount of instruction in preparing and dispensing medicine is required, but very little is necessary because pharmacy in the army is as yet "hand-me-down-canned pharmacy" and this it must not continue to be.

It is officially stated that in the United States Army "the dispensing of drugs or compounding of prescriptions is done by the non-commisisoned officers of the medical department." Those of you who are acquainted with conditions in the Army realize that many of these could not qualify to practice pharmacy in civil life, and the only reason why they are able to meet the pharmaceutical requirements of the Army is because there is practically very little true pharmacy in the Army.

We believe that there should be a complete overturning and reform in the method of handling the drug supplies in the Army, and that the entire business should be placed under the charge of a competent pharmaceutical corps. The pharmaceutical service of the U. S. Army is decidedly inferior to that of Germany, France, Spain or Japan. The commander of the German army pharmaceutical corps is attached to the medical section of the Prussian ministry of war and his rank is equal to that of the general of a brigade. The commander of the pharmaceutical corps of the French army is known as the inspector and also ranks as brigadier-general. Not only are these pharmaceutical corps in the German and French armies charged with the duty of providing the medical and surgical supplies by purchase or manufacture, and with the care, distribution and dispensing thereof, but they likewise make the sanitary, clinical

and chemical examinations for the medical corps. In reality these pharmacists are the chemists of the military service, as well as of the sanitary service.

For further information on this subject I beg to refer you to a paper by Mr. George M. Beringer, entitled "Pharmaceutical Service in the French Army," published in the *American Journal of Pharmacy*, November, 1917, page 514.

As chairman of the Committee on War Defense of the Pennsylvania Pharmaceutical Association, I have had occasion to confer with prominent medical officers in the Army and Navy and find one of the objections raised against the establishment of a pharmaceutical corps is that it will give dignity to the nostrum business and also extend the evils of self-medication, much to the detriment of the public health. I do not believe this objection valid. On the contrary I think the establishment of a pharmaceutical corps with character and duties as described in the Edmonds Bill would have the very opposite effect.

It is also urged that the establishment of such a corps would disturb the relations now existing between the medical men in the service and the hospital corps. This relation is now very satisfactory to the medical men. I am informed that the hospital corps men act as physicians' assistants and cheerfully do more or less menial work, for which college graduates are unfitted because of their superior education and social standing. This objection is taken care of in the Edmonds Bill. It is not the intent of the bill to provide an easy road to learning or a short cut to commissions. Those who enter the corps must work their way up. The bill provides educational prerequisites for entering the corps, outlines the character of the services required, and insures a better class of men to perform such services.

In conclusion, therefore, I again present for discussion the suggestion in regard to organizing local pharmaceutical corps units for promoting the Edmonds Bill in the manner above described and on the lines already inaugurated in the scientific departments of Temple University.

MEETING OF THE NATIONAL PHARMACEUTICAL SERVICE ASSOCIATION.

Congressman George W. Edmonds delivered an interesting address at the regular meeting of the National Pharmaceutical Service Association, held at the Philadelphia College of Pharmacy on Tuesday evening, November 13th. He stated that his principal object in coming to the meeting was to hear the comments of pharmacists on the proposed Bill, and to secure information which would aid him in urging its passage by Congress, and that he was very glad to say a word of encouragement to those laboring for recognition of pharmacists in the government service. Mr. Edmonds referred to the days when he was a student at the Philadelphia College of Pharmacy, and said that one of the strongest arguments that could be put forth in favor of recognition of pharmacists in the Army was that they are compelled to spend almost as much time in properly fitting themselves for their profession as are physicians, dentists and veterinarians. In other words, they deserve recognition as much as do the members of their sister profession. Congressman Edmonds urged the members to see that Congress be made familiar with the existing situation and with the provisions of the Edmonds Bill. He also impressed on the meeting that a strong committee, composed of representatives of the various divisions of the drug trade, must be sent to Washington, when a hearing is given on the Edmonds Bill by the House and Senate Committees on Military Affairs.

Dr. J. Madison Taylor made a strong appeal for recognition of pharmacists in his address "The Triple Alliance in Military Medicine." He stated that the domain of military medicine is a blend of three major subjects, medicine, dentistry and pharmacy, with sanitation and hygiene as essential factors of each; veterinary surgery as the branch. There can be no question but that each is on a practical parallel with the other in the best they aim to achieve. He declared that it would be particularly fitting for Surgeon-General Gorgas to recommend the creation of a Pharmaceutical Corps, inasmuch as his distinguished predecessors had recommended the formation of a dental corps and a veterinary corps.

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Edmonds Bill, for Securing an Army Pharmaceutical Corps." In this paper, he emphasized the necessity for showing the government the value of a Pharmaceutical Corps, and he felt that the best way of doing this was to organize such corps at the different colleges and among associations of pharmacists throughout the United States, who could be trained to step in whenever the government needed them. This paper was first discussed by Dr. John R. Minehart, dean, department of pharmacy, Temple University, who spoke of the military drill which was in vogue at the university he represented. He urged that graduates, as well as students of pharmacy, be impressed with the necessity of taking extra courses in sanitary subjects, so as to be fitted as physicians' assistants, when the country calls them to service.

As a result of the foregoing discussions, the following resolution was unanimously passed: "*Resolved,* that it is the sense of the meeting that we favor the suggestion that additions be made to the courses of instruction in colleges of pharmacy when needed to meet the requirements of the Medical Service of the Army and Navy."

Dr. P. Samuel Stout, after discussing the value of the cooperation of the pharmacist in the success of the medical work of the Army, moved that physicians be asked to coöperate in the movement to secure commissions for pharmacists, and that representatives of the medical profession be appointed on the Committee which presents the cause of the pharmacist at the hearing of the Bill before the Committee on Military Affairs.

One of the interesting features of the program was the presence of five men in uniform; two of them were called upon to speak. Private F. E. Berridge, of the post hospital connected with the Medical Department of Fort Totten, related some of his experiences as a pharmacist in the Medical Department of the Army.

A very gratifying report as to new members was made by the Secretary, 109 having been added to the list during the month.

The Treasurer's report showed a balance of $155.85, after all bills had been paid.

Application for membership should be sent to the Secretary, Robert P. Fischelis, 828 N. Fifth Street, Philadelphia, Pa. Pharmacists now in the service are also urged to send their names and addresses to the Secretary, so that if the Pharmaceutical Corps is organized, they may be referred to the proper authorities.

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CURRENT LITERATURE.

SCIENTIFIC AND TECHNICAL ABSTRACTS.

UNICORN ROOT OF INFERIOR QUALITY.—Samples of true unicorn root, *Aletris farinosa* L., obtainable in interstate trade, have been examined. As a result of this study it was found that excessive amounts of total ash and acid-insoluble ash (sand) were present. In a few instances the limit of 16 per cent. given in the new National Formulary was exceeded. The bureau is of the opinion that material properly collected would contain not more than 10 per cent. of total ash, and the amount of insoluble ash would be considerably below 5 per cent. Of special interest is the fact that one sample which contained about 3 per cent. of true unicorn root consisted otherwise entirely of false unicorn root, *Chamælirium luteum.*

The department will regard as adulterated or misbranded under the Food and Drugs Act any unicorn root containing total ash in excess of 16 per cent. or which contains material other than true unicorn root, *Aletris farinosa.* (*Service and Regulatory Announcements, U. S. Dept. of Agriculture.*)

VIBURNUM OPULUS SUBSTITUTE.—A recent survey of the *Virbunum* barks on the market showed that while all samples of black haw (*Virburnum prunifolium,* U. S. P.) examined proved to be genuine, in most instances the bark of mountain maple (*Acer spicatum* Lam.) has been substituted for true cramp bark (*Virbunum opulus,* N. F.). A similar survey of preparations of *Viburnum opulus* L. on the market, especially of fluid extracts, indicates that most of them also were prepared from *Acer* species, very probably from *Acer spicatum.*

The bark of *Acer spicatum* may be distinguished from that of *Viburnum opulus* by its fracture, which is fibrous, due to the presence of large and numerous groups of long bast fibers, while that of *Viburnum opulus* is short and weak, since it has no bast fibers, or the bast fibers, if present, are few and scattered. The barks may, furthermore, be distinguished by the color which develops when a drop of 1 per cent. or 0.1 per cent ferric chlorid solution is placed on the inner surface of the bark. After several minutes a blue color develops in the case of *Acer spicatum,* while in the case of

Viburnum opulus a green color develops, due in both instances to the tannins present in the barks. If woody tissue is present on the inner surface of the bark, it should be removed before making the test.

The bureau will consider as adulteration the substitution in whole or in part of any *Acer* species for *Viburnum opulus* in barks or their preparations.

The bureau also considers that the term "cramp bark" applies only to *Viburnum opulus,* now official in the National Formulary, and consequently should not be used for barks from other sources or their preparations. (*Service and Regulatory Announcements, U. S. Dept. of Agriculture.*)

DESULPHURING PETROLEUM.—In the course of an interesting paper on "Sulphur in Petroleum Oils," read recently before the Institute of Petroleum Technologists, London, Dr. F. Mollwo Perkin said that Messrs. Lucas, Palmer, and himself had devised a desulphurizing process which was as yet in its initial stages. It consisted in the treatment of the oil at high temperatures with gaseous ammonia. The oil may be either in the liquid or gaseous state. If the oil is liquid, the pressure must be kept sufficiently high to prevent the oil gasifying at the temperature to which it is subjected. On the other hand, the temperature should be sufficiently high to cause the ammonia to dissociate. When the oil is treated in the form of vapor, it is passed through a heating system together with the ammonia before being condensed. It has been found that sulphureted hydrogen is given off from oils containing sulphur when treated in this way.—(Through *Journal of Industrial and Engineering Chemistry.*)

GREASE RECOVERY FROM SEWAGE.—Gratifying results says *Chemical Trade Journal,* **60** (1917), 382, have attended the activities of the Corporation of Bradford, England, in the work of the recovery of grease from the city's sewage. Mr. F. Ogden Whiteley points out in his report that last year it was estimated to raise $300,000 from grease but the receipts have actually amounted to $400,000, and it is estimated that $350,000 will be provided from this source in the coming year in addition to $25,000 from the sale of manure made from the precipitated sludge after the grease has been extracted. A substantial saving has also been made as regards the chemicals used in the process of precipitation. In

normal times, sulfuric acid was used for this purpose but large supplies of this chemical are now required for the government and the Bradford Corporation have made large purchases of nitercake to take its place.—(Through *Journal of Industrial and Engineering Chemistry.*)

BARIUM AND STRONTIUM.—"Since the beginning of the war a barium chemical industry has been established in the United States to supply barium carbonate, nitrate, chloride, chlorate, hydrate, and binoxide, which were formerly imported from Germany. In 1915 this industry consumed 10 per cent. of the output of domestic barite, but the consumption in 1916 was apparently somewhat larger. The barium chemicals have a wide variety of applications, perhaps the most important of which are the use of barium binoxide in the preparation of hydrogen peroxide, that of barium chloride as a water softener, and that of various salts in the manufacture of optical glass.

"The production of 108,547 short tons in 1915 was over twice as large as that of 1914, and in 1916 the output was again doubled. The value of the 1916 output was over $1,000,000—a figure never attained before.

"Strontium salts, chiefly the nitrate, are employed to make 'red fire,' which is of wide use at this time not only for signal lights on battle fronts but for railway signals to promote the safe handling of trains at night. It is estimated that prior to 1914 about 2,000 tons of strontium nitrate were used annually in the manufacture of such 'flares' or 'Costen' and 'Bengal' lights and fireworks. Since 1915 the demand has increased considerably.

"Before the war celesite (strontium sulphate) and strontianite (strontium carbonate) were imported from Germany, England and Sicily. During 1914 and 1915 English celestite was obtained by manufacturers, but late in 1915 the exportation of strontium ores was embargoed by England.

"Apparently United States manufacturers are now using domestic ores containing only 85 per cent. of strontium sulphate, though they prefer not to use materials of lower grade than 92 per cent."—(James M. Hill, Bulletin 666-W, 3 pp. U. S. Geological Survey Bulletin. Through *Journal of Industrial and Engineering Chemistry.*)

NEW METHOD FOR DETERMINING ALDEHYDIC SUGARS.—The process described is iodometric and depends on the fact that aldehydic sugars are oxidized by excess of iodine in presence of sodium carbonate with formation of hydriodic acid and the corresponding monobasic acid thus: $RCHO + H_2O + I_2 = RCOOH + 2HI$. The reaction is not immediate: in practice about three times the theoretical amount of iodine should be used; with glucose, oxidation is complete in about thirty minutes. The excess of iodine is then titrated in the usual manner with thiosulphate solution. Simultaneously slight secondary oxidations occur. To correct for these an experiment may be run simultaneously with a specimen of pure sugar of the kind being determined to obtain the correcting factor. The results obtained by this method are very accurate. Ketonic and non-reducing sugars are not sensibly oxidized under these conditions: aldehydic sugars may therefore be determined by the method in their presence. In the case of non-reducing sugars, such as sucrose, however, the accuracy of the method is influenced by the proportion of these present. When they greatly preponderate over the aldehydic sugar the amount of secondary oxidation interferes with the result. Comparative results may however be obtained by checking against controls made simultaneously with the pure non-reducing sugar. Unfortunately the reaction mixture has affinities for other organic substances besides the aldehydic sugars; hence its practical application is limited. (J. Bougault, *Comptes rend.*, 1917, 164, 1,008.)

COLOR REACTIONS OF AMMONIACAL COCHINEAL AND OF CARMINE.—An aqueous solution of ammoniacal cochineal gives a violet color with ammonia, which is not much modified on adding a slight excess of hydrochloric acid. If this acid solution is shaken out with amyl alcohol, and the solvent is separated, and then shaken with a little aqueous solution of uranium acetate; on separating the watery layer shows a fine amethyst violet color. Under similar conditions, carmine affords an emerald green color. Sometimes, commercial ammoniacal cochineal is met with which still contains some carmine, due to the incomplete transformation of the latter into carminamide. In this case, the amyl alcohol extract is treated with an excess of powdered calcium carbonate. After a few hours' contact, the whole is thrown on a filter, when the liquid passes almost colorless. The precipitate is washed with a little alcohol, then treated with water.

The aqueous solution thus obtained will be bright red, leaving the powder on the filter grayish-violet. This red aqueous filtrate is acidified with hydrochloric acid shaken out with amyl alcohol and tested with uranium acetate, as above. It gives the characteristic violet reaction of ammoniacal cochineal. The above insoluble calcium lake left on the filter is then decomposed with hydrochloric acid; the orange acid solution thus obtained tested in the same way after again shaking out with amyl alcohol, gives the emerald green color of carmine. (C. F. Muttelet, *Annales des Falsifications,* 1917, 10,228, through *The Pharmaceutical Journal and Pharmacist.*)

Production of Antipneumococcic Serum.—In the production of immune serum for therapeutic purposes Cole and Moore say that strict attention must be paid to the immunologic specificity of the bacteria used for immunization. At present the only serum of which the therapeutic value has been proved is that effective against Type I pneumococcus infection. This serum should have agglutinating power for Type I pneumococcus and should have the power of protecting mice against large amounts of virulent culture. Experiments have shown that for producing the primary immunity most rapidly several series of small doses of dead cultures should be given, the injections being made daily for six or seven days, followed by a week in which no injections are made. To produce the highest type of immunity, probably, living organisms are required. These should be given in moderate doses daily for three days, with an interval of a week between each series of injections. By following accurately the methods described, horses may be made to produce rapidly a high grade of specific serum. The observations so far made indicate the importance of employing small doses of culture frequently repeated in this form of immunization. (*Journal of the American Medical Association.*)

Sodium Perchlorate as a Micro-Reagent.—In 1913 it was shown that sodium perchlorate affords a characteristic micro-crystalline precipitate with cocaine. Subsequently, it was found that the well-known reaction between sodium perchlorate and potassium salts was applicable to the micro-detection of the latter alkali. If a drop of a 4 or 5 per cent. solution of any soluble salt of potassium is treated with a drop of a 1:20 aqueous solution of sodium perchlorate, and the mixture is examined under a low power, as soon

as diffusion is complete, very numerous characteristic bipyramidal crystals, frequently truncated, somewhat resembling the crystals of magnesium ammonio-phosphate found in urine, will appear in the field. Under like conditions, rubidium and cæsium afford typical micro-crystalline precipitates. Lithium, ammonium, and thallium give no such reaction. Besides cocaine, the soluble salts of tropococaine, berberine, narceine, cotarnine, and papaverine all give distinctive crystals with sodium perchlorate. A concentration of 1 : 20, or even 1 : 10, may be necessary for their rapid formation. Sometimes, as with papaverine, the precipitate at first has an emulsion-like aspect; but on re-solution, by warming, followed by friction, a turbidity is obtained which speedily affords tufts of crystals. Morphine, in 1 : 100 solution, or stronger, at once forms spontaneous groups of long needles radiating from a common center. The perchlorates of its alkyl derivatives, and especially codeine, give perchlorates which are much more soluble. Brucine, and especially strychnine, give characteristic micro-crystalline perchlorates with great facility. A 1 : 100 solution of brucine salts, or the alkaloid in free acetic acid when treated with sodium perchlorate on a slide, gives crystals spontaneously; and when rubbed with a fine stirrer until turbidity appears, a characteristic micro-crystalline reaction may be easily obtained with a dilution of 1 : 200, and on rubbing with a 1 : 1000 solution. In this case the micro-crystals are long, prismatic needles, often in stellate or fasciculated groups. They may be obtained with a dilution of 1 : 500. These crystals belong to the rhombic system, and may be hexagonal, lozenge-shaped, or octahedra, with rhombic bases. Strychnine gives crystals spontaneously with a dilution of 1 : 200, and on rubbing with a 1 : 1000 solution. In this case the micro-crystals are long, prismatic needles, often in stellate or fasciculated groups. They may be obtained with a few thousandths of a milligramme of alkaloidal salt by the aid of friction. The reaction, therefore, becomes of great value in confirming the presence of these two alkaloids in toxicological work, as specially for the presence of strychnine. Narcotine and veratrine, in presence of acetic acid, give amorphous precipitates with the reagent. They have the aspect of an emulsion of spheroidal corpuscles. With veratrine, the granular formation is very distinct in a dilution of 1 : 200. Drawings are given of the typical micro-crystals of the perchlorates of strychnine and of brucine. (G.

Deniges, *Annales Chim. analyt.*, 1917, 22, 103, through *The Pharmaceutical Journal and Pharmacist.*)

MEDICAL, PHARMACEUTICAL AND DISPENSING NOTES.

THE KIND OF CALCIUM CARBONATE TO BE USED IN MEDICINE.—It is pointed out that great importance attaches to the physical condition of precipitated chalk used for medicine. When the precipitation is performed in the cold, at about 0° C., a light, hydrated carbonate having a density of 1.7 is obtained. This will show only a few crystalline grains under a high magnification. If precipitation is conducted at about 30° C., the product will consist of minute rhombohedra, and have a density of 2.7. If boiling solutions are employed, the precipitate will be formed of prismatic rhombehedra and have a density of 2.9. Since the denser form is easy to manipulate and wash, most of the precipitated calcium carbonate of commerce is of this variety. Although this may answer all official tests it is by no means suitable for medicinal use, since it is much less readily attacked by acids, and a considerable portion will pass through the intestines unacted on by the acid secretions. When calcium carbonate is prescribed the form precipitated in the cold should be specified. This form alone should receive official recognition in future pharmacopœias. (A. Berthelot, *J. Pharm. Chim.*, 1917, 16, 57, through *The Pharmaceutical Journal and Pharmacist.*)

PHYSIOLOGIC AND ANTISEPTIC ACTION OF FLAVINE.—Fleming found that flavine has a very destructive action on leukocytes, and if the action on leukocytes and bacteria be each tested for twenty-four hours its leukocidal action is far in excess of its bactericidal action. In serum under certain conditions staphylococci will grow in 1 in 32000 flavine, *B. coli* in 1 in 1000, and *B. proteus* in 1 in 2000. Flavine 1 in 8000 appears to aid growth of *B. proteus*. Flavine 1 in 500 is usually unable to sterilize in twenty-four hours an equal volume of pus from a wound. Flavine injected intravenously in large doses immediately disappears from the blood (which acquires no bactericidal power), and is taken up by the tissues, which become yellow but acquire no inhibitory power on the growth of bacteria. Flavine 1 in 100 injected into the pleural or peritoneal cavities loses its antiseptic power within twenty-four hours. If the antiseptic is allowed to act on staphylococci and leukocytes alike for

twenty-four hours and the ratio is taken of its toxicity to both of these, phenol has a coefficient ten times better than flavine when the antiseptic acts on the microbes in serum and 250 times better when the bactericidal action is estimated in pus. (From the *Lancet,* London, through the *Journal of the American Medical Association.*)

No Need to Fear Botulism in Properly Prepared Products.—According to the bacteriologists of the United States Department of Agriculture there is no danger that the type of food poisoning known as "botulism" will result from eating fruits or vegetables which have been canned by any of the methods recommended by the United States Department of Agriculture, provided such directions have been followed carefully.

In case of any doubt as to whether the contents of a particular can have spoiled, the safest plan is to throw it away, although all danger of botulism may be avoided by boiling the contents of the can for a few minutes, since the *Bacillus botulinus* and the toxin or poison which it produces are killed by such treatment, since the spores of *B. botulinus* are killed by heating for one hour at 175 degrees Fahrenheit. No canned food of any kind which shows any signs of spoilage should ever be eaten.

The Therapeutic Value of Cinnamon.—Dr. W. B. Drummond (*British Medical Journal,* June 9) states that essence of cinnamon in twenty-five-drop doses is one of the most effective remedies for coryza. With reference to the claim made for cinnamon as a preventive of measles, Dr. Drummond reports that he gave as much powdered cinnamon as would lie on a six-pence night and morning to twenty children in a hospital ward who had been exposed to infection by a nurse having German measles, and that at the end of four weeks no second case of German measles had occurred. (*The Australasian Journal of Pharmacy.*)

The Paraffin Treatment of Burns.—Surgeon-Colonel Hurd, in the *Lancet,* June 2, states that he has used a preparation made according to the following formula for nearly a year, with highly satisfactory results:

Resin	1 part.
Beeswax	1 part.
Paraffin	4 parts.

Melt in a dish set in boiling water for half an hour. Apply with a metal spray to form a thick layer on the affected surface. Next cover with a very thin layer of cotton, while the wax is still hot, and then with a camel's-hair brush paint on three or four layers of the wax. After it has hardened for ten minutes bandage.

FOR VERMIN IN THE TRENCHES.—A mixture of equal parts of oil of peppermint and oil of eucalyptus is stated to answer splendidly for lice. A little is smeared on the body with the fingers. (N. Aylmer Coates, *Prescriber,* June, 1917, 127, through *The Pharmaceutical Journal and Pharmacist.*)

MANGE, RIGWORM, AND LICE IN HORSES.—In an article describing the conditions under which horses may become affected with skin disease, a very full account of the methods of treatment for mange, ringworm, and lice is given. For mange it has been found that a mixture of sulphur, 4 oz.; oil of tar, 1 oz.; sperm oil, 1 quart, gives the best results. Before applying this a cleansing agent should be used, and for this purpose, paraffin emulsion is the best thing to use. When the washed surface is dry the sulphur mixture is applied with a brush, and well brushed in. The application is not disturbed for six days, when it should be removed by washing. For ringworm, tincture of iodine has been mostly used, and with good results. Two applications are usually sufficient. If the lesions are scattered and widespread, the oily dressing used for mange gives the best results, one application well applied generally being sufficient. For lice, after clipping, as in the other cases, the thorough application of liquor cresolis and water, 1 in 40, gives very good results. (The cresol preparation is not specified, but probably liq. cresolis saponatus would answer, or simply a solution of soft soap in an equal weight of cresol.) Paraffin emulsion also is excellent, and it thoroughly cleanses the skin at the same time. Stavesacre solutions are most satisfactory. (Capt. J. F. D. Tutt, A.V.C., *Vet. Rec.,* May 5, 1917, 461, through *The Pharmaceutical Journal and Pharmacist.*)

COMMERCIAL AND TRADE INTEREST.

SYNTHETIC RUBBER FROM CARBIDE.—The manufacture of acetone with a view to the production of synthetic rubber is of considerable importance in Germany at present. The importance of

this industry, says *Chemical Trade Journal*, 61 (1917), 26, is indicated by the fact that some of the largest firms in Germany, such as the Konsortium fur Elektrochemische Industrie of Nurnberg, the Elektrotech. Werke of Bitterfeld, the Farbenfab. of Bayer & Co., Griesheim, and others, have been occupied with this problem for some years. There are firms in Germany producing 10 to 50 tons of carbide per day in order to convert the acetylene into acetic acid and acetone, the latter being intended chiefly for the production of synthetic rubber.

This new industry should be of special interest to Switzerland, since the necessary carbide will in the future be available in large quantities in that country. After the war, the export of carbide will be considerably reduced and this product will, therefore, become much cheaper. On the other hand, the price of rubber will remain high for several years. (From *The Journal of Industrial and Engineering Chemistry*.)

Potash and Other Chemicals in Japan's Trade.—Consul-General George H. Scidmore, Yokohama, reports that Japanese exports of potassium chlorate to American and other destinations are increasing at a remarkable rate. The *Japan Advertiser* states that this trade development is regarded as a sign of the country's industrial progress. The article was principally imported from Europe before the war, to meet the increasing demand from match manufacturers. When the war broke out and shipments from France stopped, Japan's total supply was only 500 barrels a month.

The production in this country now far exceeds consumption. A dealer in chemicals is quoted by the *Advertiser* as saying that the total shipments from Yokohama for the first six months of the year were valued at $280,812, the principal destinations being China, British India, the Dutch East Indies, Russia, America, and Great Britain. (From *Commerce Reports*.)

Japanese Production and Exports of Sulphuric Acid.—Since the beginning of the year the price of sulphuric acid in Japan has been steadily advancing, owing to increased exports to Russia and China, and also to the Allies for war purposes. As a result, some of the artificial-fertilizer companies have reduced the output of fertilizers and devoted their energies to the manufacture of sulphuric acid, while a number of companies have been established ex-

clusively for the manufacture of the chemical. Its output has accordingly increased in a large measure, and some anxiety is entertained with regard to overproduction after the war. According to latest investigations, the present total output in this country amounts to 582,500 tons a year, excluding the output of a few factories that is not made public. Of this quantity, 421,150 tons is consumed by the manufacturers themselves for the manufacture of sulphate of ammonia, hydrochloric acid, etc., leaving the remaining 161,150 tons available for general requirements. The domestic demands now amount to about 100,000 tons a year, so that the quantity for export is about 60,000 tons. It is estimated that the output of sulphuric acid, if turned out at the present rate, will be in excess of the demand by about 100,000 tons on the resumption of normal conditions after the war. (Through Canadian Department of Trade and Commerce, translated from *Japan Weekly Chronicle.*)

VEGETABLE-WAX INDUSTRY OF JAPAN.—An industry of Japan which has made remarkable progress in recent years is that concerned with the extraction of vegetable wax, which is coming into greater demand in foreign markets. The output has been gradually increasing, and now stands in the neighborhood of 1,700,000 yen, or about $850,000 per year. The work of extraction is being organized on a larger scale.

The principal regions of production are in the Island of Kyushu, especially around the city of Fukuoka, which accounts for nearly half of the total output. The product is used abroad principally in the manufacture of polishes, pomade and soaps, and in dressing leather.

Most of this vegetable wax is derived from the fruit kernels of a tree peculiar to Japan, which begins to fruit at about 15 years, and sometimes bears heavily when it is over 100 years old. It reaches a height of 20 to 25 feet, and produces from 30 to 150 pounds of nuts annually. The best wax is made from nuts that have been kept over the winter, and, generally speaking, the quality of the product improves with the age of the nut. The wax is extracted by crushing and steaming the nuts, and then subjecting the mass to pressure. A second wax is secured by repressing.

The crude wax, which solidifies at 50 degrees, is cast into round moulds of a little more than a pound each. It is next refined, the process used being a traditional one and peculiar to Japan. It is

mixed with wood or charcoal, ash and water, thoroughly boiled, and dropped into cold water, so as to form what are called wax flowers. These are taken out and exposed to the sun for about 20 days, when the process of boiling, making the flowers, and sunning is repeated. The wax is then boiled a third time, and the best quality taken off the top while it is in a molten condition. Recently improved methods have begun to come into use, and the crude wax is treated with an alkaline solution. (From *Commerce Reports.*)

EXPORTS OF MINERAL OILS SHOW BIG INCREASE.—More mineral oils were exported from the United States during the fiscal year 1917 than ever before, the total amounting to 2,749,434 gallons valued at $230,953,149, according to figures made public by the Bureau of Foreign and Domestic Commerce, of the Department of Commerce. This was an increase of approximately 300,000,000 gallons and $65,000,000 over 1916 and about 470,000,000 gallons and $79,000,000 over 1914, the last normal year before the war. Only a small percentage of the total exported was crude oil. (From the U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C.)

CODFISH AND OIL TRADE OF NORWAY.—The spring cod fishery of the Finmarken coast closed on June 23. The returns for the season are 17,056,550 kilos (calculated at 6,317,240 cod), as against 26,854,600 kilos (9,946,150 cod) in 1916, 43,279,200 kilos (16,020,330 cod) in 1915, 63,612,650 kilos (23,560,240 cod) in 1914, and 93,923,800 kilos (34,787,000 cod) in 1913. The very poor returns this year are caused chiefly by the uncertain conditions, great parts of the fishing districts lying inside of the German "danger zone."

As the fish ruled fat the quantity of oil was comparatively large. In Lofoten 100 liters of liver yielded an average of 51 liters of steamed medicinal oil, as against 49 liters last year. The fish also ruled somewhat larger than last year. (Canadian Department of Trade and Commerce, Ottawa, Sept. 24, through *Commerce Reports.*)

CINCHONA CULTIVATION.—The areas under cinchona in Bengal during the year 1916–17, according to the government report, have been increased to 2,405 acres, as against 2,295 acres in the previous

year; and attempts have been made to extend the plantations gradually. Systematic seed collection, based on analysis of parent trees, has been practised, as in previous years. Owing to the European war, the unit rate of bark has much increased, the average market unit rate for 1916–17 being 20–60 cents. Large numbers of cinchona trees at Munsong have arrived at maturity, but on account of the insufficiency of money it was found impossible to harvest a large quantity of dry bark for the factory, the Budget grant having been fixed to a limited amount for five years. (From *The Pharmaceutical Journal and Pharmacist.*)

WARNING AGAINST MEDICINE FRAUD.—"Imposters posing as federal employees are trying to sell rheumatism and other 'cures' which they represent to the gullible as being made by the United States Government," is a warning issued by the Bureau of Chemistry, United States Department of Agriculture. Letters received from residents of Minnesota and South Dakota tell of such misrepresentations by agents of the "United States Medical Dispensary" or "Dr. Henry Post," Washington, D. C. The packages and labels guaranteed for $20 "cures" for various ailments but failed to give any address of those who are to refund. Federal inspectors have been unable to locate any such concern or doctor in Washington or elsewhere. (Office of Information, U. S. Dep't of Agriculture.)

CORRESPONDENCE.

BALTIMORE, November 20, 1917.

EDITOR AMERICAN JOURNAL OF PHARMACY,
145 N. Tenth St.,
Philadelphia, Pa.

I am sending you herewith, copy of a letter which our committee, charged with the creation of a permanent memorial to the late Dr. Charles Caspari, Jr., is mailing to such of his former students, friends and admirers as they can reach. For the benefit of those we do not know of and who may wish to contribute to this memorial, we will appreciate such publicity as you will give this letter.

I am directed by the committee to express to you their appreciation for such assistance as you can give us in this connection.

Very truly yours,

E. F. KELLY.

THE CHARLES CASPARI, JR., MEMORIAL COMMITTEE.

BALTIMORE, MD., November 15, 1917.

At a meeting in memory of the late Prof. Charles Caspari, Jr., held at the University of Maryland on October 23, several suggestions were offered that some permanent memorial of his life be established. Following these suggestions, Dr. J. F. Hancock, chairman, asked the officers and those gentlemen who at the meeting represented the College of Pharmacy and the manufacturing, wholesale and retail pharmacists, to act as a committee to consider these suggestions and suggest some suitable plan of action. The committee on November 8 organized and elected Dr. J. F. Hancock chairman and E. F. Kelly secretary-treasurer. After careful consideration and general discussion of the matter, the committee has decided to ask contributions from former students, friends and admirers, to provide an oil portrait of Prof. Caspari, to be hung on the walls of the department of pharmacy, University of Maryland, and a scholarship, or scholarships, for senior students in the department of pharmacy, to be awarded annually by the faculty of pharmacy, and to be known as The Charles Caspari, Jr., Scholarship, or Scholarships.

The fund collected, after the cost of the portrait and necessary expenses are deducted, will be invested in stable, interest-bearing securities, preferably government bonds, and these will be trusteed to the faculty of pharmacy of the University of Maryland, the interest only to be used in providing the scholarship, or scholarships, which are to cover the annual tuition fee only.

It is confidently believed by the committee that a memorial of such practical value would have most appealed to him whom we honor, and who gave his best efforts to the instruction of students. It is impossible to address personally all who may wish to take part in this memorial, but the committee will give the movement the widest publicity and hope that all who may desire to do so will consider themselves invited to contribute to the fund.

It is requested that all contributions be made payable to E. F

Kelly, secretary-treasurer, and addressed to him at Lombard and Greene Streets, Baltimore, Maryland.

Respectfully,

JOHN F. HANCOCK, Chairman,
D. M. R. CULBRETH,
JOHN B. THOMAS,
A. R. L. DOHME,
JOHN C. MUTH,
E. F. KELLY,

Committee.

BOOK REVIEWS.

ELEMENTARY LESSONS IN LATIN, by Otto A. Wall, M.D., Ph.G., Professor of Materia Medica, Pharmacognosy and Botany in the St. Louis College of Pharmacy.

Professor Wall states in the preface of this volume that "the elementary principles of the Latin language contained in this little book are sufficient to enable the student to read the Latin edition of the German pharmacopœia, which is as much Latin as is necessary for the pharmaceutical or medical student." He might have added that it is far more than the average student of these professions ever acquires. The majority of pharmaceutical students and many medical students enter college with no training at all in Latin, and in the limited time which can be devoted to this subject in college a knowledge of only a small portion of the grammar can be gained, and the study of Latin is limited to those forms and principles which are absolutely essential to enable the student to understand Latin titles and prescriptions. Professor Wall's treatment of the subject is therefore much more complete than is found in the ordinary textbook on pharmaceutical Latin.

The book is divided into three parts; Part I includes eighty pages and is devoted entirely to the forms and principles of grammar. The verb forms, active and passive, are given in full although all tenses of the indicative and subjunctive except the present are placed in an appendix. Many of the irregular verbs are also given and the uses of moods and of the verbal noun and adjective forms are explained. The declension of nouns, pronouns, and adjectives and the rules for their use receive liberal treatment and enough syntax

is given to fully justify the author in his statement that a knowledge of these principles will enable the student to read the Latin edition of the German pharmacopœia.

Part II contains the vocabularies and reading exercises. These cover sixty pages. Professor Wall believes that by the separation of the grammar from the exercises and vocabularies the student can more clearly grasp the essentials of the language and escape the confusion of mind which results from having the grammar, vocabularies and exercises intermixed. Many teachers will not agree with him in his view, believing that forms and constructions are learned more rapidly by constant practice in their use in sentences. In fact the practice of interspersing grammar work among the reading exercise is almost invariably followed by authors of beginners' books in Latin.

Part III, consisting of eight pages, is devoted to a comparison of Latin words with their English derivatives and to a brief study of the formation of words, and is designed to assist the student in acquiring a Latin vocabulary.

No general vocabulary is given, but numerous short vocabularies totaling some nine hundred words are scattered through Part II. Even with these it is necessary for the student "to refer to a dictionary for the meaning of many of the words in the reading exercises." This arrangement of vocabularies does not seem as satisfactory as the method usually followed and the use of a separate lexicon certainly does not tend to a saving of time in the preparation of the lessons. In our opinion the book though containing some good features is hardly likely to displace the Latin textbooks already in use in colleges of pharmacy.

W. S. TRUESDELL.

THE PRESCRIPTION, by Otto A. Wall, Ph.G., M.D. Fourth and Revised Edition. C. V. Mosby Co., St. Louis, 1917.

So great is the wealth of material contained in this book of two hundred and seventy-three pages, that one finds it difficult to treat it adequately in the limited space of the customary review.

In the treatment of his subject the author has divided it into two grand divisions, one treating of permanent prescriptions and the other of extemporaneous prescriptions. The classification, permanent, is applied to such formulas as are contained in standard works, as the various pharmacopœias and formularies.

In the preliminary chapter, entitled "General Considerations," the various forms, in which remedies may be prescribed and dispensed, are given, together with the medicinal uses to which they are best suited and the Latin terms applied to each class. This information is presented in a very complete and interesting manner. Attention is, also, here given to the "Form of Formulas."

The chapter on "Weights and Measures" is a treatise, in itself, upon the subject. It contains tables of the various systems, and an account of the history of the origin of the various units.

The chapter devoted to the "Language" of the prescription gives extended treatment of the subject of prescription Latin. The various declensions and conjugations are clearly and concisely given, and a vocabulary of Latin words, phrases and abbreviations, covering twenty-three pages is included. By a study of this chapter, one having little or no knowledge of Latin might become proficient in the pharmaceutical and medical application of the language.

Under the head of "Extemporaneous Prescriptions" the various parts of the prescription, how it is built up, incompatibilities, the determination of dosage, and other related subjects are clearly and fully discussed. Much sound advice is given to the prescriber, from a study of which the physician as well as the pharmacist would profit.

The final portion of the work is given to the "History of the Prescription." In it is given an interesting account of the evolution of the prescription, its superscription and other signs used in prescribing.

The mechanical make-up of the book is excellent. The type and imprint being clear, clean and easily read.

The author has handled his subject, in general, in a logical, lucid and forceful manner. As a result of this, the work is not only a valuable book for the reference library of the pharmacist and the physician, but, also, an excellent one for hours of interesting and instructive reading.

G. M. Beringer, Jr.

Everyman's Chemistry. The Chemist's Point of View and his Recent Work Told for the Layman, by Ellwood Hendrick. Harper's Modern Science Series, Harper & Bros., Publishers, New York and London. 346 pages, with an appendix and an index.

The need and desire for popular education in scientific subjects

seems to be growing rapidly. There have been published during the past ten years more books of a popular scientific type, such as the "Chemistry of Familiar Things," "Household Chemistry," "Chemistry in the Home," etc., than doubtless appeared during the preceding 100 years.

The book entitled "Everyman's Chemistry" is one of the foregoing type, yet essentially different. Its style is clever and appealing. Such chapter headings as "Chemical Miseries" and "The Red Headed Halogens" give the reader a sense of anticipatory enjoyment which is not denied him when the subject matter is reached. The first chapter is a convincing example of how to develop the reader's interest in a subject which he may have believed too difficult for him to understand. The final paragraph from this chapter is well worth quoting:

"Chemistry is not only the intelligence department of industry; it is everywhere and we cannot get away from it. Every kitchen is a laboratory, every baker is a chemical manufacturer and every butcher is a chemical warehouse man. Chemistry washes us, launders our clothes, bleaches and dyes them; it provides us with metals, with our morning paper and with books; it helps the farmer to grow our food; and when all is over, whether we be burned to ashes or buried in the ground, it is by chemical processes that our bodies go back again into the great order of things."

It is surprising how clearly and interestingly the author discusses such difficult technical subjects as the ionic theory and colloids. The description of the composition and properties of permutit is especially noteworthy, and the articles on iron and steel, glass, lime, mortar and cement, and indeed, many others in the inorganic portion of the book, are excellent.

The portion of the book devoted to organic compounds is a disappointment. There is much of interest and value, it is true, but why such important organic substances as argol, tartaric acid, citric acid, gelatin and baking powders, for instance, should not even be mentioned when considerable space is given to the structural formulas of a number of the coal tar intermediates, such as paranitraniline, amido-naphthol disulphonic acid, etc., is difficult to understand. Then, too, it is strange to spend so much time in discussing Van't Hoff and his studies in stereo-chemistry, without mentioning even a single word as regards the influence of Pasteur's work on the optical activity of the tartaric acids in this connection.

There are statements, too, in the latter portion of the book, which are misleading, such as this from page 289, under Candy: "The glucose is made from corn and the solution is treated with a mild acid to split off the simple sugar from the starch." Also this from page 303: "You can nitrify cellulose and make nitrocellulose an explosive compound known as guncotton. If you attempt to do this to starch it is apt to split right down to sugars. Mixed nitric and sulphuric acids dissolve cellulose to nitrocellulose."

The worst error in the entire book, however, consists in calling resins gums and referring to them as polymerized sugars and then citing rosin as a type. The word resin does not appear in this portion of the book at all.

There are two appendices, containing respectively a tabular synopsis of the elements and a bibliography of books along similar lines or which were consulted in preparing the book. There are a few typographical errors in the book and in the index, which indicate somewhat hasty preparation.

Taking it altogether, however, and making due allowance for the defects which have been mentioned, the book is one from which every reader, whether he be chemist or layman, should draw pleasure and profit.

C. H. Law.

PERSONAL ITEMS.

Dr. John A. Roddy.—Shortly after the declaration of war with Germany, John A. Roddy, professor of bacteriology and hygiene in the Philadelphia College of Pharmacy and associate in hygiene and bacteriology at the Jefferson Medical College, was called into the Army Medical Service. He was commissioned as lieutenant and assigned to Fort Slocum, where he was actively engaged in the examination and treatment of the thousands of army recruits received at that station. Recently he was transferred to Camp Dix, N. J., and assigned to the 303 Engineers Regiment. His many friends will be pleased to learn that he was promoted and commissioned captain on September 29, 1917.

David W. Ramsauer, a graduate of the Philadelphia College of Pharmacy in 1902 and the winner of the Procter Prize that year, has been elected vice-president of the Grover-Stewart Drug Co., of

Jacksonville, Florida. Since leaving the college Mr. Ramsauer has had a brilliant career. He is now an ex-president of the Florida State Pharmaceutical Association, secretary of the State Pharmaceutical Examining Board. He has likewise been prominent in business circles and in civic matters in his home town of Palatka.

PROFESSOR AND MRS. JOHN URI LLOYD announce the wedding of their daughter, Dorothy Webster, to Mr. James Arthur Brett, Jr., on Monday, October 22. The professor's numerous pharmaceutical friends, including the readers of the AMERICAN JOURNAL OF PHARMACY, extend sincere congratulations.

CHARLES E. HAYWARD recently celebrated the twenty-fifth anniversary of his connection with the H. K. Mulford Co. He entered the employ of that firm as an assistant in the tablet department. By his application and thoroughness he won advancement and in 1909 was made general superintendent of their laboratories and in 1913 was elected a member of the board of directors. In celebration of his twenty-five years of service, the board of directors of the company presented him with a handsome gold watch suitably engraved.

CHARLES A. SMITH for more than twenty-five years associated with the Jacobs pharmacies in Atlanta, Ga., has severed his connection with that firm and has opened a new store in the new Arcade Building in the center of the business section of Atlanta. The new concern will be known as the Charles A. Smith Drug Company and doubtless will be one of the leading stores in that southern metropolis.

M. GUIMAND GEORGES, a member of the French Army Pharmaceutical Corps, has been honored for heroic service, the military medal and war cross having been conferred on him.

M. RICHARDOU, a pharmacist aide-major attached to the Territorial Army of France, was by a decree on July 27 last named a Chevalier of the Legion of Honor.

PROF. CHARLES E. VANDERKLEED, for many years associated as head chemist with Messrs. H. K. Mulford Co., has severed his connection with that firm. With ample capital and backing he has

organized the Markleed Co., who expect to engage in the manufacture of a number of important medicinal and technical chemicals.

OBITUARY NOTICES.

CHARLES HOLZHAUER.—It has again become our sad duty to record the decease of another leader of American pharmacy. Charles Holzhauer, President of the American Pharmaceutical Association, died suddenly at his home in Newark, N. J., on Monday afternoon, November 19, at the age of sixty-nine years. He was at home, playing with his grandchildren, whose company and play he greatly enjoyed, when the call of death came.

Charles Holzhauer was a self-made man in every sense that these words imply. He applied himself energetically in whatever he undertook; be it his personal business, Association work in pharmacy, work of the church, corporation or civic duty alike received his enthusiastic best efforts. Those who were associated with him in pharmaceutical circles knew of his generous, big-hearted philanthropy by his deeds and never by any statements of his own, for he was not wont to say much about his personal doings and disliked anything pertaining to show or notoriety.

In the New Jersey Pharmaceutical Association, he was the leader whose sound judgment and advice was sought in many trying situations. In the American Pharmaceutical Association, he was always faithful in attendance and noteworthy in service, and it is our most sincere regret that he was not spared to fulfil his ambition to carry into effect his plans as president for this year.

Mr. Edward A. Sayre, a personal friend and pharmaceutical associate of many years, will contribute to an early number of the AMERICAN JOURNAL OF PHARMACY an appropriate memoir of our deceased friend.

SIR EDWARD EVANS. On October 10, at Spital Old Hall, Bromborough, Cheshire, death claimed Sir Edward Evans, who long held a prominent position in the wholesale drug circles in England. He was the second son of Edward Evans and grandson of the founder of the wholesale drug business now carried on by Evans Sons, Lesher & Webb, Ltd., of London and Liverpool and with branches in Montreal and New York. At the time of his decease he was chairman of this corporation.

He had a varied experience in the importing and wholesale dealing in drug products and had a host of friends in the various drug organizations and pharmaceutical societies in which he was an active worker. He served a term as president of the Drug Club and was president of the British Pharmaceutical Conference 1911–1912.

He took an active part in political matters and his ability as an ardent worker as a local or district organizer in the Liberal Party was recognized by the leaders of that political party. He was knighted in 1906, and in 1910, in recognition of his record in political and social reform service, his Liverpool friends presented him with his portrait, the presentation address being made by the then Prime Minister, Mr. H. H. Asquith.

His decease in his seventy-second year terminated a successful business and social career marked by a high sense of integrity and honor.

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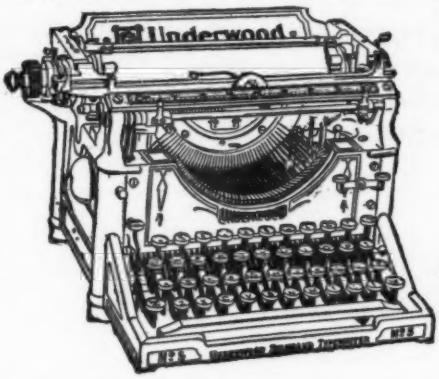

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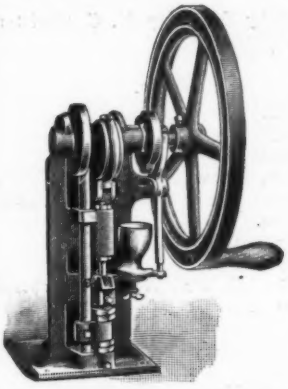

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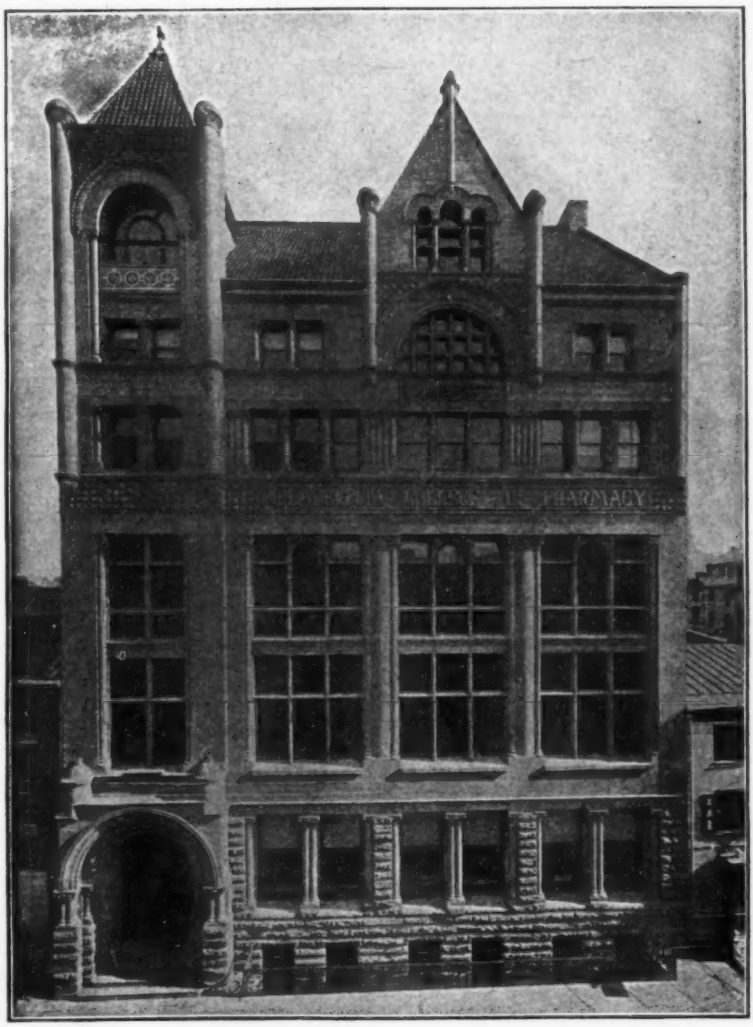

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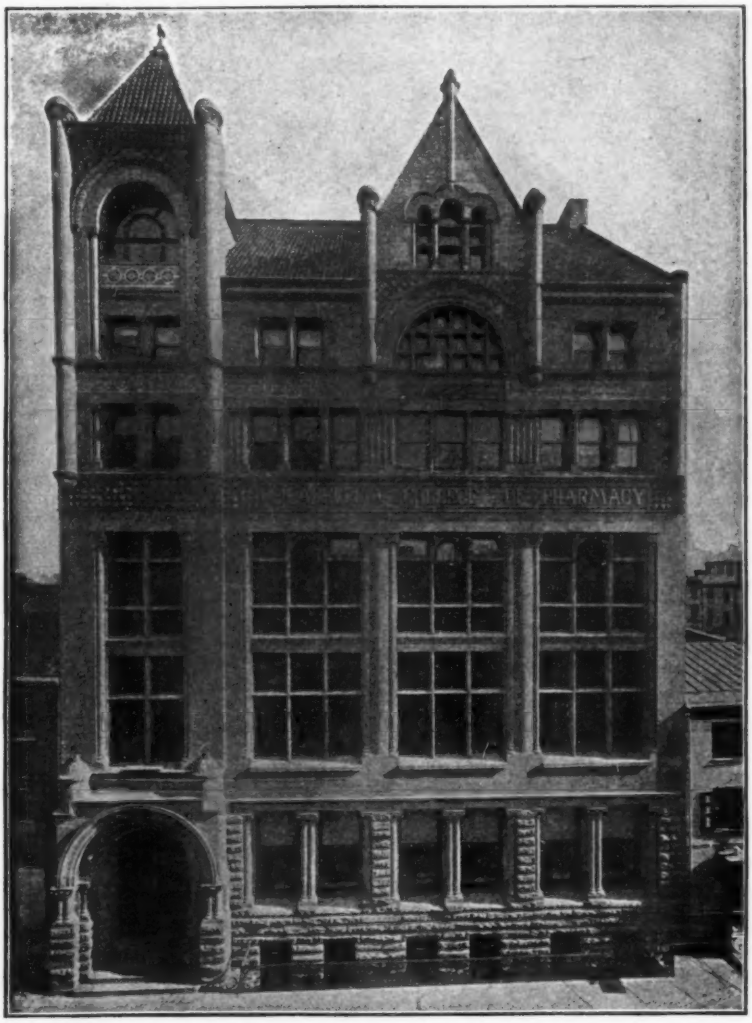

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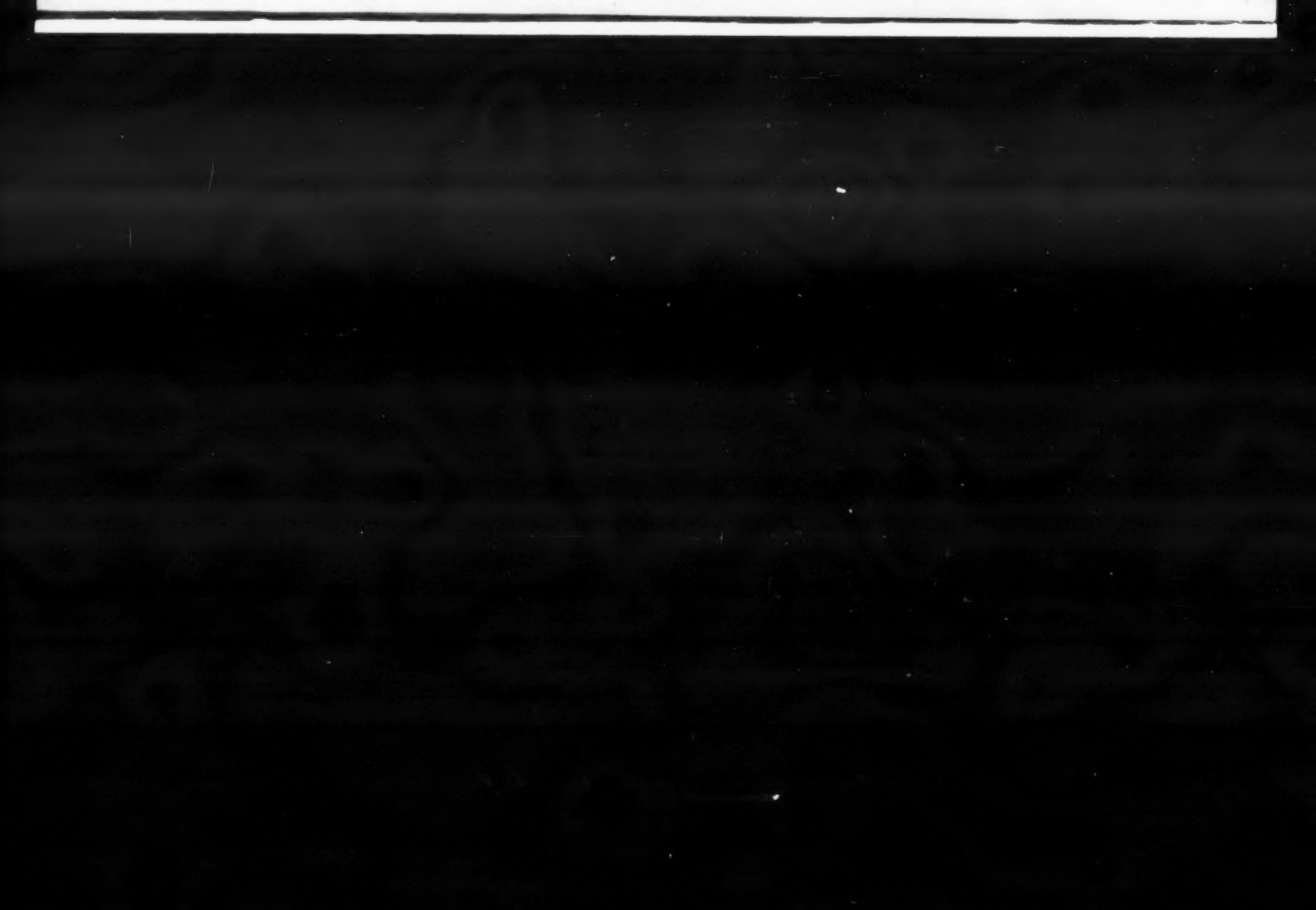

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